MODEL LAND USE PLAN OF MORADABAD DISTRICT

(Revised)

Sponsored by:

STATE LAND USE BOARD
DEPARTMENT OF PLANNING
GOVERNMENT OF UTTAR PRADESH

PREPARED BY:

Dr. FAHIMUDDIN
DR. R C TYAGI

GIRI INSTITUTE OF DEVELOPMENT STUDIES
Sector-O, Aliganj Housing Scheme
LUCKNOW-226 024

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PREFACE

The availability of land for various uses is limited. Therefore, utilization and conservation of land resources are important for their sustainable use. Formulation of Model Land Use Plan is an important step for promoting a desirable land use. With this view, State Land Use Board, Department of Planning, Government of Uttar Pradesh, entrusted the Giri Institute of Development Studies, Luckow to prepare Model Land Use Plan for six districts of Uttar Pradesh, namely, Lucknow, Kanpur, Bareilly, Moradabad, Meerut and Agra. The present report is the Model Land Use Plan of Agra district.

We are highly obliged to Shri S.N. Jha, IAS, the then Principal Secretary, Department of Planning, Government of Uttar Pradesh for sponsoring the task to our Institute. Mr. Anis Ansari, IAS, who has been the Principal Secretary, Department of Planning, after Shri Jha, provided us very useful guidance. We are extremely grateful to Shri Amal Kumar Verma, IAS, the present Principal Secretary, Department of Planning for his valuable guidance on the subject. We feel grateful to Shri Kunwar Fateh Bahadur, IAS, and Shri Navtej Singh, IAS, Secretary, Department of Planning for their guidance and encouragement. We are also extending our thanks to Shri A.N. Mishra, IAS, Special Secretary, Planning for his continuous support in pursuance of the study.

We feel highly obliged to Ms. Mridula Singh, Additional Director, Land Use Board for providing the opportunity to work on this important subject. Her deep and thorough understanding of the subject helped us to analyze the important issues relating to planning for land resources. The other officials of the Land Use Board, particularly, Dr. (Ms) Anandeshwari Awasthi, SRO, Shri Murali Lal, RO, Shri Arvind Kumar Verma, RO and Shri K.B. Lal provided all the necessary support during the study and hence we are highly thankful to all of them.

A Model Land Use Plan can not be prepared without the active support of concerned departments. Shri Vasudev Verma, Additional Director, Department of Agriculture, Shri A.K. Dwivedi, Chief Planner, Department of Forest, Shri Satyavir Singh Dalal, Senior Planner, Town and Country Planning Department and many officials of the Board of Revenue, Forest, Agriculture Departments, Sodic Land Reclamation Project, Directorate of Economics and Statistics have been quite helpful in the preparation of this Model Land Use Plan.

We feel very much obliged to District Magistrate and Chief Development Officer, Moradabad and other government officials of different Departments in the District for their active participation in the final presentation of the Plan.

The research team of the Institute consisting of Ajai Kumar Singh, Mohd. Kaleem, Ravi Nigam, Vinay Kumar Bisht, Zamir Ahmad, Shubhra Tandon, Sanjai Sharma and Ms. Sweta Yadav remained involved in data collection, processing and computerization. All of them did their job efficiently and deserves our appreciation. Last but not the least, Shri Manoharan K. deserves our thanks for word processing the manuscript efficiently.

Fahimuddin
R.C. Tyagi

Giri Institute of Development Studies
Sector O, Aliganj Housing Scheme
Lucknow 226 024

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GEO-PHYSICAL CHARACTERISTICS

The district of Moradabad (the popular form of the spelling of which is Muradabad) forms a part of the Rohilkhand Division and is named after its headquarters city which lies on the right bank of the river Ramganga. It is said that Rustam Khan, Governor of Sambhal under Shahjahan, built a fort here and compelled a number of agriculturists and traders to settle round about it, calling the place Rustamnagar – a name which, to escape the emperor's wrath, was changed to Muradabad in honour of the young prince, Murad.

1.1 LOCATION AND AREA

The district lies between Lat. 28°20′ and 29°16′ North and Long.78°4′ and 79°0′ East, forming a large but fairly compact stretch of country (roughly rectangular in shape) with a large projection northwards and on the south-east and a somewhat less defined one at the south centre. Its length from north to south is 64.37 kms. on the West, 80.46 kms. in the middle and 90.12 kms. on the East; its breadth in the middle from west to east is 83.68 kms. It is bounded on the north by the Bijnore and Nainital districts on the east by that of Rampur and on the south by that of Badaun. The Ganga forms its natural boundary on the West and separates it from the districts of Bulandshahar and Moradabad.

As per the census records of 1991 the district had a geographical area of 3806.7 square kilometres. It stands nineteenth in the State in respect of area. The area of the district is apt to vary owing to the fluxion of the Ganga.

1.2 PHYSIOGRAPHY

The average elevation of the district is about 204 metres above the sea level with a marked slope from north to south, the level falling from 234 metres in the extreme north in Tehsil Thakurdwara to 177 metres in the south of Tehsil Bilari, the average falling being 59 cms. per kilometre. There is also a considerable fall in altitude from west to east, the highest benchmark along the Bareilly-Moradabad road (about 40 kms. West of Moradabad city) being 214.27 m. and the mean gradient being about 39 cm. per km. There is a slight rise again to the north-east beyond the valley of the Ramganga. Being the upper Ganga Plain, the district has no marked physical breaks except the river courses and certain surface variations, a brief account of which follows. Broadly speaking the district can be divided into seven physical divisions – the Ganga Khadar or lowlands, the bhur or sandy tract, the Udla (gritty waterlogged soil), the katchr or uplands, the north central tract, the Ramganga Khadar and the north-eastern tract.

1.2.1 THE GANGA KHADAR

This tract extends in a narrow belt along the Western border for about 64.37. kms. with a breadth varying from 3.22 kms. in the North to about 12 Kms. in the South and has an approximate area of 697 sq.kms. It is elevated in the middle and so escapes ordinary floods but its lower portions are liable to inundation. On the actual river bank is a strip of the most recent alluvium, in places possessing a very fertile deposit of silt and elsewhere covered with tamarisk which runs wild in the same left by the annual floods. The open khadar that comes next is interested by numerous drainage channels and backwaters of the river. It is liable to be flooded and saturated and the presence of saline efflorescences to impair the fertility of the soil. Further East is a belt of higher land which has a hard and

dry soil and is covered with dhak and palm trees. The land improves towards the south where there are several large and important villages; elsewhere the population is scanty and nomadic. Lying at the foot of the upland ridge on the West is an irregular chain of swamps running throughout its length from North to South and for the most part forming detached pools, occasionally broadening out into large jhils (lakes) which are filled by the drainage from the uplands and also by the overflow from the Ganga. During the rainy season the whole of the khadar or lowland is submerged. The Western portion of the Hasanpur Tehsil comprises precarious areas. The chief crops of the Ganga khadar are wheat, rice and sugarcane.

1.2.2 THE BHUR

This undulating sandy upland tract, comprising the Eastern portion of Tehsil Hasanpur (except for a small block of good loamy soil in the North-East corner), the Western portion of Tehsil Sambhal and a very small area of Tehsil Amroha, lies to the East of the Ganga Khadar and runs throughout the length of the district – its breadth being 12 to 13 kms. and its area about 1,098 sq.kms. The tract has no stream of any importance and consists of a series of fairly parallel sandy ridges separated by level plains. The soil is firmer and more fertile in the shallow troughs between the ridges, which form minor drainage channels, locally known as chhoiyas. The soil of the bhur proper is generally rather arid but waterlogged in the depressions, especially in wet years when the drainage lines cease to function and the light soil becomes saturated and is rendered useless for a long period, possibly because effective percolation is prevented by an underlying stratum of indurated clay. This tract is thinly populated and almost devoid of trees except in the neighbourhood of the larger villages. Life here is almost intolerable during the summer

months when the sand, driven by the scorching West winds, strikes the land. Wheat (mixed with barley and bajra) is the chief crop.

1.2.3 THE UDLA

To the East of the Northern half of the Sambhal bhur and extending from the South-West corner of Tehsil Amroha to a point a short way West of Sambhal town lies the small peculiar Udla tract which covers an area of about 227 sq.kms. It is neither bhur nor katehr, the soil being hard and gritty and yet waterlogged. During a wet cycle moisture oozes from the ground on very slight pressure – a feature from which the name Udla (ud meaning water) is perhaps derived. There is no adequate outlet for the drainage (which perforce has to be absorbed) in consequence of which the water level is remarkably high. The tract suffers more from excessive rainfall than from drought as should saturation occur it takes long to recover but in dry years it is not unfertile and the rabi can be irrigated easily.

1.2.4 THE KATEHR

This upland tract, comprising the Eastern half of Tehsil Sambhal and the whole of the Bilari Tehsil and extending to the borders of the Rampur and Badaun districts on the East and South respectively, embraces an area of about 1,546 sq.kms. and has a wide level plain of great fertility broken by small ridges of lighter and sandier soil. The soil here is a rich friable loam, the clayey area being small. It slopes towards the south and south-east as is evident from the courses followed by the Sot, the Ari and their affluents. There are very few depressions in this physical unit and there is generally no danger of water logging with a number of larger and prosperous villages situated in it, its aspect affords a

striking contrast to the bhur lying on the West. The main crops produced here are wheat, jowar, bajra, rice and sugarcane.

1.2.5 NORTH-CENTRAL TRACT

This tract, which includes the eastern watershed of the northern bhur and terminates at the Ramganga khadar, embraces almost the whole of Tehsil Amroha, the North-East corner of Tehsil Hasanpur and the South-Western part of Tehsil Moradabad. It has an area of about 1,051 sq.kms. and is drained mainly by the Gangan and its tributaries. Its surface varies considerably and is far from homogenous. The high, broad plateau lying between the Gangan and the Ramganga valley on the East has a poor soil with deficient means of irrigation. Through the middle passes a large ridge of bhur, running parallel to the course of the river Ban as far as the Sambhal border. In the West the tract is uniformly high and sandy, though level and firmer than the main bhur into which it merges in the Tehsils of Hasanpur and Sambhal, the chief crops produced here being jowar, bajra, urd, moong, wheat and barley. The remainder consists mainly of a loam of mediocre quality, greatly inferior to the katehr and in places (especially to the south-east_ stretches of clay dominate, with rice as the chief staple. The bhur ridge and the unirrigated plateau are the only precarious areas – cultivation fluctuating very considerably in the former, the upper Gangan valley being the most fertile portion of this tract.

1.2.6 THE RAMGANGA KHADAR

This tract, which has an area of about 411 sq.kms. is influenced by the rivers Ramganga, Kosi and Dhela and presents a great contrast to the Ganga khadar in that it possesses fertile soil, except where sand has been deposited after the annual flood. There

being no saturation in the khadar, the rabi harvest is excellent at all times and chances of damage to the kharif are present only in years of exceptional floods. The soil is a firm loam or clay and is commonly utilized for growing vegetables, the finest wheat and sugarcane especially in the neighbourhood of Moradabad city. It is almost impossible to define the limits of the khadar which keeps on changing owing to the vagaries of the river which has a shallow bed and changes its course at will. The khadar of the Dhela is narrow and of little importance. Taken as a whole, this physical unit has attained a high standard of development and is also useful as a grazing ground.

1.2.7 NORTH-EASTERN TRACT

This tract, comprising the whole of the Thakurdwara Tehsil and the greater part of Tehsil Moradabad, lies to the North of the Ramganga khadar and covers an area about 906 sq.kms. It is intersected by a number of rivers and streams which flow southwards into the Ramganga, the whole having a submontane character and representing a southerly continuation of the Nainital Tarai but being very diversified on account of the constant changes of level and the action of the numerous drainage channels. In the central and northern parts of Tehsil Thakurdwara, which stand high, the soil is light and poor, facilities for irrigation deficient and much of the land precarious. Elsewhere the prevailing soil is a stiff loam, bearing good crops of rice in kharif and wheat, gram and linseed in rabi. In the Western and Southern portions there are large tracts of clay, known as jhada, which yield only rice and depend partly on the rainfall and partly on the Tumaria canal and its distributaries. In a dry year the kharif crops fail throughout the tract but the rabi is nearly always good, as percolation wells can be dug almost everywhere, water being available at a depth of 3 to 4 m. (from the upper coarse sand stratum).

1.3 RIVERS AND WATER RESOURCES

The only large rivers of the district are the Ganga on the West and the Ramganga on the East. A brief description of these rivers and of their numerous affluents is given below.

1.3.1 GANGA

The Ganga, which the Hindus have held sacred from time immemorial, first assumes this name at Deo Prayag (district Tehri Garhwal) where its parent streams, the Bhagirathi and the Alaknanda, have their confluence – the former rising at Gaumukh in the Gangotri glacier (in the district of Uttarkashi) and the latter in district Chamoli. It first touches the district of Moradabad in the North-West, about 4 kms. West of the Village of Papsari (in Tehsil Hasanpur) and then flows in a southerly direction along the Western boundary of the district for nearly 65 kms. (which is also the entire length of Tehsil Hasanpur from North to South) and separates the district from those of Moradabad and Bulandshahar. Its khadar is full of minor streams and watercourses, some of which are merely backwaters of the river and some which receive a large amount of drainage from the uplands. In the district it has only two insignificant tributaries – the Baia and the Matwali (West), the former joining it near the village of Kharagpur and the latter near that of Dhoria. Flowing southwards, it leaves the district at the village of Salara. There are numerous old and abandoned channels in its khadar. The bed of the river is large and sandy with an underlying stratum of nodular limestone here and there. Its volume and velocity vary at different periods of the year and are greatest during July and August. In summer it is 200 m. wide but during the rains spreads out to a width of over 1.5 kms. It is fordable at certain places during the cold weather. Its' banks generally suffer from slow erosion and

the sois of the Khadar villages (which lie adjacent to it) from increasing infertility due to the sand that it deposits during the monsoon months when in spate. About the beginning of the last quarter of the nineteenth century it took a turn eastwards near Biharipur and ruined a large stretch of fertile land, sweeping across the Khadar till it was checked by a raised belt known as the Bagad Bangar. Efforts have since been made from time to time to check its easterly tendency but without much success. It once took an easterly bend near the village of Sirsa and destroyed the greater part of that fine village. It is bridged by the railway near the station of Kankather, where the channel has been more or less trained by constructing embankments. Tigri, opposite Garhmukhteshwar (in Moradabad district) and Sirsa Sarai, opposite Ahar (in Bulandshahar district), are the only places in the district on the left bank of the river ;which deserve mention, the first named being the scene of a great bathing fair, held on Kartiki-purnima (full moon day of Kartika) simultaneously with the more celebrated assemblage on the right bank. The ferries managed by the Zilla Parishad, Moradabad, and Ahar, Farida and Basai-all on the western bank in the Bulandshahar district, Puth (in Moradabad) and Sherpur Depthi on the eastern bank (in Tehsil Hasanpur). It is navigable and utilized for small and local traffic.

1.3.2 BAHA

This small stream enters the district from the district of Bijnore near the village of Papsari (in Tehsil Hassanpur) on the northern border of the district. Flowing southwards for about 2 kms. it takes a south-westerly course as far as Mukarampur from where it flows in a south-easterly direction till it merges in a broad semi-circular lagoon known as the Jaithal Dhab (from which the district boundary is about 5 kms. away), south of the village of Azampur (in the same Tehsil) where it is joined by another small stream, the Krishni, and irrigates the rabi crops.

1.3.3 KRISHNI

This small stream enters the district (from the lowlying lands of the Bijnore district) near the village of Paharpur Inayatpur (in Tehsil Hasanpur) and separates the district from that of Bijnore for about 3 kms. Flowing for another 5 kms., it merges in the Jaithal Dhab near the village of Azampur, where its breadth is about 27 m.

1.3.4 BAIA

Emerging from the Jaithal Dhab near the village of Sherpur, the Baia flows in a southerly course through the Ganga khadar for about 20 kms., with a width varying from 9 to 46 m. and joins the Ganga near the village of Tigri. It is perennial stream of considerable size and is regularly employed for irrigation purposes, earthen dams being built annually on it.

1.3.5 MATWALI (WEST)

This stream issues from a swamp near the village of Chakanwala (in Tehsil Hasanpur) about 3 kms. from the village of Alinagar. Flowing southwards almost parallel to the Ganga as far as Patti Para, it takes an easterly course for about 2 kms. and then flows south again, joining the Ganga near the village of Dhoria (in Tehsil Hasanpur) During the rains its breadth is 11 to 18 m. It is bridged near the villages of Shiampur and Kankather.

1.3.6 MAHAWA

This stream (which is also known as the Mohaia or western Bagad) rises near Dhauti (in Tehsil Hasanpur) about 6 kms. south of the village of Azampur where the swamp below the bhur clieff spreads out into a deep morass. Receiving flood-water from the Bagad Jhil,

it flows south and follows the line of jhils as far as Basai Sahsoli (close to the village of Sihali Jagir). It takes a south-easterly course near the village of Nawabpura Khader and leaves the district near the village of Dehri Khader to join the Ganga in the district of Badaun. Throughout its course it is fed by several small channels and is dammed at many places.

1.3.7 KRISHNI

This stream rises from the Dhab near the village of Jhundi Muafi in the central part of Tehsil Hasanpur. It follows a winding course and before leaving the district near the village of Imratpur it forms, for about 3 kms. the boundary between this district and that of Badaun. In this district it is known as the Tikta or eastern Bagad in the early part of its course but is called the Khulaila after it leaves the swamp near the village of Kanaita and the Nakatia from the village of Adampur onwards. In its course it is fed by many small channels and is also connected with the Jabda and Jharrawali jhils lying on the east. During the monsoon season it receives the water of the river Mahawa (or western Bagad) when the whole of the Ganga khadar becomes an unbroken sheet of water except for the higher portions of the Bagad Bangar. Its waters are used for irrigation, earthen dams being built annually on it.

1.3.8 SOT

This river is also known as the Yari-wafadar (faithful friend), a name said to have been given to it by Muhammad Shah (the emperor) when he marched against Ali Muhammad, the Rohilla chief. Rising in a depression, near the village of Peelakund (in Tehsil Amroha) it flows in a southerly or south-easterly direction through the Sambhal Katehr, traverses the extreme southern corner of Tehsil Bilari and leaves the district near

the village of Barrai to enter the Badaun district. it has a well-defined and fairly broad valley, in most places of considerable depth, with a long slope from the uplands down to the alluvial soil which is found in the bed of the stream. It is a perennial stream and has a large volume of water throughout the year. It is not easily fordable and commerce between places on its opposite banks was difficult in the past, but with the construction of bridges near the villages of Bhawanipur, Manotta and Dhakia in the Sambhal Tehsil, the Sot villages have been linked and have become prosperous. The khadar, which extends for about 5 kms. in the Bilari Tehsil, is poor and liable to become waterlogged. In Tehsil Sambhal it has an average breadth of about 46 m. and a depth of about 5 m. Its waters are used for irrigating only a small area lying within its valley. The Sot has no affluents of any importance in this district, a chhoiya joining it on the right bank at Dhakia, the Kharra nala on the Badaun border and a channel and two watercourses in between – all being insignificant.

1.3.9 ARI

This small stream (which is also known as the Aril or Aral) rises in a low tract of clay near the village of Mainather (in Tehsil Bilari) which is marked by a high mound on the Moradabad-Sambhal road. The villagers say that it emerges from a jhil near the village of Gumsam (in Tehsil Sambhal) lying just on the border of Tehsil Bilari but it first forms a recognizable channel only at Mainather. It then flows in a sinuous south-easterly course for about 32 kms. through the centre of Bilari Tehsil where it has only 2 insignificant tributaries, the first (which rises near the village of Gumthal) joining it near the village of Bannia Khera and the other (which has its source near the village of Deora), near the village of Atwa. Its channel is both narrow and shallow in the beginning but becomes wider and deeper as it approaches the border of the district of Badaun. For a short

distance it forms the boundary between the district of Moradabad and that of Badaun after which it leaves the former. Its bed is mostly of clay and becomes almost dry in the winter months. Large parts of its khadar are spongy and defy cultivation.

1.3.10 BAN

This stream (an affluent of the Gangan) rises in the Bijnore district and enters the Moradabad district enar the village of Kalapur (or Kalampur) in the north-west of Tehsil Amroha. It joins the river Gangan on its right bank at the village of Sirsa Manihar. In its course of about 28 kms. it has a well-marked valley with a long slope, often scarred by ravines. It is generally not fordable in the rainy season.

1.3.11 GANGAN

Rising in the north of the district of Bijnore, this river enters the district of Moradabad near the village of Kaimukhia (in Tehsil Amroha) and forms the boundary of the district in the north for a short distance. It then flows in a winding course in a south-easterly direction for about 5 kms. and then goes on towards the south-west for about 2 kms. Near the village of Isapur it makes a bend and again flows on in a south-easterly direction as far as the village of Sihali Narain where it is fed by the Karula on the left bank and further down, at Sirsa Manihar, by the Ban on the right bank. Preceding in the same direction it forms the natural boundary between Tehsils Amroha and Moradabad for about 2 kms. and again further on between Tehsils Moradabad and Bilari. Near the village of Pandit Nagla (in Tehsil Moradabad) it is fed by another Karula – a small stream rising in a chain of jhils to the north-west of the city. It leaves the district near the village of Turtipur (in Tehsil Bilari). Although it carries an ample supply of water, it is generally fordable even in the rains. It has well-defined banks which are generally high and firm on the east and

low and sandy towards the West. In its upper course, the character of the bed is clayish sand which gradually becomes clayish in the south. The river is crossed by girder bridges near the villages of Lankri Fazilpur and Pandit Nagla in Tehsil Moradabad on the Delhi-Lucknow and the Moradabad-Chandausi roads respectively. It also has a railway bridge near the village of Jatia Saidullahpur (in Tehsil Moradabad) about 10 kms. from the city. It is little used for irrigation purposes in the district. A dam is made annually at the village of Umri and, in a few villages lower down its course, water is sometimes lifted from it to irrigate the adjacent lands.

1.3.12 RAMGANGA

Rising in the hills of the Chamoli district, some distance south of the snow range of the Himalayas, the Ramganga, the principal river of district Moradabad, enters the district from the district of Bijnore in the north-west corner of the Thakurdwara Tehsil. It flows south along the western border and then enters Tehsil Moradabad, skirting the city on the east and then, making a south-easterly bend, goes on towards Rampur. Throughout its very irregular course of about 85 kms. in the district, it has no affluents on the right bank but on the left several streams feed it from the highland on the north, those deserving mention being the Phika, the Repi, the Dhela, the Rajhera and the Kosi. The valley of the river is broad and well defined (particularly on the west), the right bank along the eastern boundary of Tehsil Amroha and through the Moradabad Tehsil as far as the city being high, steep and rugged. The left bank in Tehsil Thakurdwara is almost similar but in Moradabad the khadar is a rich expanse of low undulating country. A little down stream from the city the high bank on the right disappears and there is a gentle slope from the river to the upland. In this tract the river changes its course at will and when it spate destroys the crops in the lowland during the rains. During the hot season it shrinks considerably and

becomes fordable almost everywhere but during the rains it becomes swollen and is a great obstacle to traffic, its width near Moradabad city being about 2 kms., the water flowing at a rate pf 8 km. an hour. The Zilla Parishad ferries are at Aghwanpur (on the road to Thakurdwara), and Daulatpur Tigri. A seasonal pontoon bridge near the city on the Moradabad-Nainital road is utilized to cross the river. Near the railway station of Kathghar (right bank), which is at a distance of 4 kms. from the Moradabad railway junction sation, the river is crossed by a fine girder bridge (648 kms. in length) with a roadway on the same level as the railway track. The river is usually navigable by vessels of small draught but it cannot be used for irrigation owing to the enormous variations in its discharge (from 20 to 100,000 cusecs), except where power pumping is resorted to.

1.3.13 PHIKA

This stream, which rises in the hills of Kumaun (and forms the boundary for some distance between the district of Nainital and that of Bijnore), enters the district near the deserted village of Pritampur on the northern border and Tehsil Thakurdwara. Flowing in a south-westerly direction for about 3 kms. in this Tehsil, it leaves the district near the village of Surjannagar to join the Ramganga in the district of Bijnore. Formerly it effects its junction with the Ramganga inside the district but the westerly recession of the Ramganga moved the confluence to a place about 8 kms. south-west of Surjannagar. It has carved out a small khadar area of its own which is liable to inundation.

1.3.14 KHALIA

Rising in the Tarai, this stream enters the district near the village of Tanda Alam in the north-west of Tehsil Thakurdwara and receives the Kawakhar when it becomes known as the Repi or Rapi. It is joined by the Jabdi, a Tarai stream, before it meets the Ramganga.

1.3.15 KHALIA

This stream starts as a nullah close to Thakurdwara town and flows in a southerly direction as far as the village of Sultanpur Dost. Taking almost a westerly course from here it is fed, on the right bank, by a small tributary, the Lapakna, near the village of Rehta Muafi Mustehkam before it joins the Ramganga near the deserted village of Kharagpur. It has a deep bed flanked on each side by patches of scrubs jungle and becomes an impassable barrier of carts, during the rainy season. Throughout its course it is utilized extensively for irrigating the sugarcane fields.

1.3.16 LAPAKNA

Rising in the Tarai region, this stream enters the district near the village of Raghoowala (in Tehsil Thakurdwara) after forming the northern boundary of the district for about a kilometre. On the right bank it is fed by the Lapakna nala near the village of Isapur and on the left bank by the Kurka near the village of Rehta Muafi Mustehkam, the united stream, shortly afterwards discharging its water into the Ramganga. It is utilized for irrigation purposes in exceptionally dry years.

1.3.17 DHELA

This stream, which rises in the hills of the Nainital district, enters the district near the village of Kalyanpur (in Tehsil Thakurdwara) after forming for about 2 kms. the boundary between the two districts. At this place it is fed by the Matwali (East) or Dhandi which separates the Thakurdwara Tehsil from that of Kashipur (Nainital district) for some distance. It forms the boundary between Tehsils Thakurdwara and Moradabad for some distance and is fed by the Damdama near the village of Bhagatpur Ratan before it joins the Ramganga at a place about 3 kms. north of the city. Though its bed is shallow it has a

considerable volume of water and since the construction of the Tumaria dam (in district Nainital) it has not changed its course. It sometimes floods its narrow khadar during the rains. It is fordable and is not a serious barrier to communication as it dries up completely during May and June. It is bridged on the Moradabad-Thakurdwara-Kashipur road near the village of Dharak Nagla (in Tehsil Thakurdwara) and is dammed near the village of Kalyanpur to provide irrigation for the lands on its banks.

1.3.18 RAJHERA

This stream has its origin in the depressions of the rice lands near the village of Bhagatpur Tanda (in Tehsil Moradabad) and joins the Ramganga near the village of Samdha Ramsahai (in Tehsil Moradabad). It is fed by several minor watercourses, the chief being the Kachia. Its bed is characterized by clayish sand and its banks by poor and broken soil. It is spanned by a masonry arch bridge near the railway station of Dalpatpur, on the road leading to Bareilly and at a short distance downstream by a railway bridge. Throughout its course it is largely utilized for irrigation.

1.3.19 BAHALLA

This stream (which is also known as the Bah) rises in the Tarai and touching the district boundary near the village of Udmawala (in Tehsil Moradabad), skirts the Moradabad Tehsil boundary on the east. During its course, before joining the Kosi near the village of Khabaria Bhur (in Tehsil Moradabad), it is fed by the Nachna (which rises a few kilometres to the south of Kashipur in the Nainital district) and its tributary, the Ghogra, near the village of Kher Khata. It has a clayish bed and does not affect the lands on its banks which are firm and well defined. In the dry season it is about a metre in depth and 4 m. in breadth but during the rains, when in spate, the depth increases to about 2 m. and the breadth to about 30 m. To the west of the village of Thiriadan (in

Tehsil Moradabad) the stream is crossed by a bridge on the Moradabad-Darhyal-Nainital road. Throughout its course it is utilized for irrigation, dams being built at Mandia and several other places.

1.3.20 KOSI

This large stream (which is also known as the Kausilya or Kosila) rises in district Almora and passing through the districts of Nainital and Rampur touches the district boundary on the east near the village of Khabaria Bhur (in Tehsil Moradabad) where it is fed by the Bahalla or Bah. It then leaves the district and after traversing the western part of the district of Rampur reappears near the village of Barwara Khas in the south-eastern part of the Moradabad Tehsil. At this place it makes a sharp bend towards the west and then after flowing for about 2 kms. leaves the district. Running through the Rampur district in a southerly course of about 2 kms. it once again enters the Moradabad district near the village of Dhatura Megha Nagla and joins the Ramganga south of the village of Bhaya Nagla (in Tehsil Moradabad). Its average depth during the rains is about 2 m. and its breadth about 305 m. but during the dry season it shrinks considerably to a depth of about 0.6 m. and to about 18 m. in breadth. The bed of this erratic stream is sandy and its banks low and sandy in the north though firm and high towards the south. The railway bridge to the east of the village of Ganesh Ghat (in Tehsil Moradabad) is used by the traffic on the Moradabad-Bareilly road. The river is crossed during the rains by ferries at Darhyal (in the Rampur district) on the Nainital road and at Ganesh Ghat on the Bareilly road and in the summer by bridges of boats at these places. It is used extensively for irrigation.

1.3.21 KALELA (OR KHULALA)

This small stream (which is one of the main western drainage channels of the district) rises in some small ponds near the village of Chuharpur Muafi (in Tehsil

Hasanpur). It flows southwards and has a breadth of 9 m. as far as the village of Jhundi Muafi (in Tehsil Hasanpur) but when it empties itself in the great Jabda jhil near the village of Kanaita, it is about 18 m. breadth. During the rains it becomes very swollen throughout its course of about 19 km.

1.3.22 NILAJI (OR NELAJI)

This drainage channel rises near the lowlands of the village of Dhakia Bhoor (in Tehsil Hasanpur). Flowing south through the villages of Nagli Muafi and Manauta (at which place a bridge spans it), it cuts through the cliffs (overhanging the lowland) in a south-westerly direction. It then falls into the Bagad Jhil near the village of Deebpur. One of its offshoots joins the western Bagad or Mahawa near the village of Soherka (in Tehsil Hasanpur). It dries up after the rains. Its total length is about 16 kms. its breadth varying from 9 to 14 m.

1.3.23 CHHOIYA NALA

This drainage channel starts near the village of Roza (in Tehsil Bilari) and flows in a south-easterly direction along the southern half of the eastern boundary of Tehsil Bilari, forming the natural dividing line between this district and that of Rampur. Flowing south, it is fed by a watercourse which emerges from a Jhil lying to the east of the village of Deora Khas (in Tehsil Bilari). After being strengthened by several small watercourses which bring down the drainage from the uplands, it leaves the district near the village of Balkaranpur (in Tehsil Bilari) to join the Ari in the district of Badaun. In its upper reaches it has no khadar but lower down its valley broadens out and has a recognizable khadar.

1.4 OTHER WATER BODIES

Except for a few long stretches of water occurring along the Ganga khadar, true jhils hardly exist in the district. There are a few of local importance in Tehsils Bilari,

Hasanpur, Moradabad and Sambhal – the largest being that in the last named in the village of Dhatra Sheikh, its area and depth being about 101 hectares and 2 to 3 m. respectively. Among the other lakes that deserve mention are those near the villages of Didaura (in Tehsil Moradabad) and Paigrafatpur (in Tehsil Bilari) their areas being about 32 and 6 hectares and their depths about 6 m. and 2 m. respectively. There are some others that usually dry up during the winter. At times they are utilized for irrigation purposes but not infrequently are of no avail when water is most needed. Fish are found in most of them and they are visited by water-fowl during the winter. A number of them are used for the cultivation of Singhara or water-chestnut (Traba Bispinosa) and bhasinda (the stem of the lotus, part of which is edible).

1.5 CLIMATE

The climate of the district which is the same as that of the other sub-Himalayan districts in the state, is influenced by the proximity of district to the Himalaya and Tarai Swamps and is characterized by a hot summer, a bracing cold season and general dryness, except in the south-west monsoon season. Climatically the year may be divided into four seasons. The cold season from about the middle of November to February, is followed by the summer which continues till about the third week of June. The south-west monsoon then ushers in the rainy season which lasts till about the end of September. October and the first half of November forming the post-monsoon season.

1.5.1 RAINFALL

The district has 6 rain-gauge stations – Amroha, Bilari, Hasanpur, Moradabad, Sambhal and Thakurdwara with records of periods ranging from 97 to 100 years. The rainfall in the district generally increases from the south-west to the north-east, the annual

rainfall varying from 817.1 mm at Sambhal to 1135.3 mm at Thakurdwara. About 86 per cent of the annual rainfall in the district is received during the monsoon season, July and August being the months with the maximum rainfall. The average annual rainfall in the district is 944.3 mm (37.18") but the variation (from year to year) is appreciable. During the period from 1901 to 1991 the highest annual rainfall was in 1948, when it amounted to 156 per cent of the normal and the lowest in 1905 when it amounted to 57 per cent. In this 50 year period, rainfall less than 80 per cent of the normal occurred in 13 years. 3 of them being consecutive. At individual stations two consecutive years of such low rainfall occurred 4 times a Moradabad, Sambhal and Thakurdwara and once each at the other 3 stations, there being three consecutive years of such low rainfall once t 4 of the 5 stations.

The statement regarding the frequency of the annual rainfall in the district given below for the period 1901 to 1990, shows that the annual rainfall was between 700 mm (27.56") and 1200 mm (47.24").

Range in mm	Number of Years	Range in mm	Number of Years
501 – 600	8	1001-1100	5
601 – 700	8	1101-1200	2
7001 – 800	9	1201-1300	8
801 – 900	11	1301-1400	8
901 – 1000	5	1401-1500	1

On an average there are 43 rainy days (days with rainfall of 2.5 mm – 10 cents or more) in a year, the number varying from 39 at Hasanpur to 48 at Thakurdwara. The heaviest rainfall in 24 hours recorded at any station in the district was 363.7 mm (14.32") at Amroha on September 15, 1957.

1.5.2 TEMPERATURE

There is no meteorological observatory in the district and the account that follows is based on the records of the observations in the neighbouring districts where similar

climatic conditions prevail. After October both day and night temperatures decreases rapidly and in January (the coldest month) the mean daily maximum temperature is about 21°C (69.8°F) and the mean daily minimum about 8°C (46.4°F). When the district is in the grip of cold waves (which occur in the wake of western disturbances in the winter months), the minimum temperature occasionally drops to about freezing point of water and frosts also occur. Temperature starts rising after February, heralding the onset of the hot season. May and early part of June constitute the hottest period of the year. The mean daily maximum temperature being about 40°C (104°F) and the mean daily minimum at about 25°C (77°F) in May. The dry, dust-laden winds which often blow at this time of the year, add to the intensity of the heat, the maximum temperature going up to over 45°C (113°F) at times. There is an appreciable drop in day temperatures by about the third week of June, when the monsoon advances into the district but the nights continue to be warm. There is a slight increase in the day temperature in September but the night temperature starts decreasing.

1.5.3 HUMIDITY

The air is very humid during the south-west monsoon season. During the rest of the year the humidity is comparatively less, the morning generally being more humid than the afternoons. The driest part of the year is the summer season when the humidity in the afternoon can be low as 30 per cent.

1.5.4 CLOUDINESS

The skies are generally heavily clouded or overcast during the monsoon season and sometimes for short spells during the cold season but during the rest of the year they are mostly clear or lightly clouded.

1.5.5 WINDS

Winds, which are generally light, get stronger in the summer and monsoon seasons. Westerlies and north-westerlies are more common from October to April and easterlies and south-easterlies (which appear in May) in the monsoon season.

1.5.6 SPECIAL WEATHER PHENOMENA

Thunder storms (at times accompanied by squalls and hail) sometimes occur in association with western disturbances, the district also experiencing occasional fogs in the cold season. Dust-storms and thunder-storms occur occasionally durir , the hot season and during the monsoon months the rain is often accompanied with thunder.

1.6 FLORA AND FAUNA

The district, which lies in the tropical dry deciduous type of the vegetative division, is devoid of any extensive natural vegetation. The total of timber forest under the forest department and the Gaon Sabhas was as follows in 1963-64:

Tehsil	Area (in Hectares) Under Forest Department	Area (in hectares) under Gaon Sabhas
Hasanpur	836.89	--
Amroha	57.47	7.69
Total	894.36	7.69

An area of 1,253.31 hectares in the district was covered with grazing grounds. These grassy wastes, which abound in the river valleys and are met with occasionally in the uplands, are very valuable for the landholders who derive a considerable revenue in the form of grazing dues, as well as from the sale of timber, fuel and grass, but the need for extending cultivation has largely reduced such areas.

The total area covered by thatching grasses including bamboo (Bambuwsa spp. and Dendrocal amus strictus) and shrubs was 829.20 hectares of which 817.46 hectares lie in tehsil Hasanpur, 9.30 hectares in tehsil Amroha and the remaining in tehsil Bilari. This vegetation is generally confined to the western edge of the bhur and is mostly of the kind called sarpat or pater (Typha elephantis) which is used for thatching purposes and also yields ban (a rough twine) employed for stringing cots and making ropes and matting, the stalks being used for making sieves, winnowing baskets and screens. In the lowlands there also grow various kinds of grasses including the gander (Andropogon muricatum), the lining of earthen wells also often being made of these coarse grasses. The khadars of the Ganga and Ramganga are mostly covered with Jhau (Tamarix dioica) which is also of considerable value when mature, as it is largely used for fuel and also for making baskets, etc. The shrubs that grow in the district are karonda (Carissa spinarum), clerodendron infortunatum, cassia tora, cassia occidentalis, lantana camara, pogostimen spices, capparis species, and madar (calotropis gigantean).

The chief varieties of trees generally found in the forests and wastelands of the district are shisham (Dalbergia sissoo), Jamun (Syzygium cumini or Eugenia Jambolana), Imli (Tamarindus indicia), Neem (Azadirachta Indica), mango (Mangifera indica), ber (Zizyphus vulgaris, Zizyphus jujube), semal (Salmalia malabarica or Bombax malabaricum), white siris (Albizzia procera) and black siris (Albizzia lebbeck). Other trees found throughout the district are dhak (Butea monosperma), babul (Acacia Arabica), kanji (Toddalia asiatica), pipal (Ficus religiosa), bargad or banyan (Ficus bengalensis), pakar (ficus infectoria), gular (Ficus glomerata), mahua (Madhuka indica), arjun (Terminalia arjuna) and putranjiva (Putranjiva Rox).

Ornamental trees such as amaltas (cvassia fistuia), ashoka (polyalthia longifolia), kachnar (Bauhinia spp.), karak champa (pterospermum acerifolium), gul mohar (Delonix regia), Jacaranda (Jacaranda ovalifolia), silky oak or silver oak (Grevillea robusta) and ducalyptus (Eucalyptus spp.), are met within gardens and groves and also from roadside avenues.

The district is deficient n jungles but is well provided with groves, the total area under which was 11,116.67 hectares and which consist chiefly of mango, Jamun or wild plum, Imli, gular, bel or wood apple (Aegle marmelos), guava (Psidium guajava), aonla (Emblica officinalis), ber, barhal (Artocarpus, lakoocha), kathal (Artocarpus heterophyllus), shi9sham and Neem.

In former days a large number and variety of wild animals was found in the district, mot of which was covered with forests and grass-lands. Firuz.Shah Tughlaq (1351-1388) is said to have marched into Katehr annually for several years on hunting expeditions. Sinkandar Lodi (1489-1517), who visited Katehr on a hunting expedition and also lived at Sambhal for about four years, is said to have been greatly pleased with the abundance of game which included the wild elephant (Elephas maximus) and the lordly denizen of the jungle, the tiger (Felis tigris), which was found in the Ganga khadar and the bush jungles in the eastern parts of Tehsil Amroha and also in Tehsil Thakurdwara. Large sareas of land in the Ganga khadar were covered with coarse grasses, babul or kikar (Acacia Arabica) and provided shelter for leopards (Panthera tigris) and wolves (Camis lupus). In the forest tracts the hyena (Hyaena hyaena), spotted deer (Axix axis), black buck (Antilope cervicapra), jackal (Canis Aureus) and boar (Sus Scrofa) were common and snakes and scorpions numerous. Increase in the human population led to a large part of these forests and bushes being cleared and brought under the plough. With their domain thus usurped, most of these animals gradually disappeared, the number and species of wild life being

much fewer in the district than in the adjoining districts of Bijnore and Nainital. At times leopard, spotted deer, wild pig and sambar (Cercus unicolor) visit the northern fringes of the district from the adjoining district of Nainital. The small areas from where the thorny bushes of kikar, babul and coarse grasses have not been cleared (as the soil is poor and the land unfit for cultivation) afford some cover for the herbivore that feed on crops in neighbouring fields. The species at present met with are the hog deer (Axis porcinus), pig, porcupine (Hystrix leucura), squirrel (Sciurus palmarum), monkey (Innus rhesus), hare (Lepus ruficaudatus) and nilgai (Boselephas tragocamelus). The last named is neither bovine nor blue (as its name erroneously suggests) but is slate grey and is an antelope of a large size, which damages the standing crops in the district and is a great frequenter of sugarcane fields.

1.6.1 BIRDS

The birds found in the district are mostly the same as those which occur throughout the Gangetic plain. Among the game birds the most common are the grey partridge (Francolinus pondicerianus), black partridge (Francolinus francolinus) and the common quail (Coturnix coromandelicus), the last named generally arriving early in June and disappearing before the end of the cold weather. The griffon vulture (Gyps fulvus) visits the district in the winter. Among the protected non-game birds the chief are the cuckoo (Hierococcyx varius), black drongo (Dicrurus macrocerus), cattle egret (babulcus ibis), little egret (Egrella garzella), common grey heron (Ardea cinerea), pond heron (Ardeola grayii), hoopoe (Upupa epops), blue jay or Indian roller (Corasius benghalensis), jungle myna (Aethiopsar fuscus) and common kingfisher (Alcedo althis). The pea-fowl (Pavo cristatus), also a protected species, is found throughout the district. Other birds which are commonly found in the district are the little grebe (Podiceps ruficollis), little cormorant

(Phalacr5ocorax niger), sarus (Antigone antigone), house crow (Corvus spiedens), snake-bird (Anhinga melanogaster), ring-dove (Streplopelia decaocta), spooted dove (streptopelia chinensis), night jar (Caprimulgus asiaticus), parakeet (Psittacula), rock-pigeon (Columba Livia), yellow-throated sparrow (Gymnorhis xanthvollis), spotbill (Anas poecilorhyncha), koel (Eudynamis scolopaceus), sparrow hawk (Accipiter nisus) and mottled wood owl (Strix ocellatum).

1.6.2 REPTILES

Snakes are found in the district especially in the rural areas, the chief being the cobra (Naja naja), krait (Bungarus caeruleus), Russel's viper or necklace snake (Daboia Russellie or vipera russellii) and lesser viper (Echis carinata). Of souria the most important are the common house gecko (Hemidactylus maculates). The common Gangetic mud tortoise (Trionyx gangeticus) and ocellated mud tortoise (Trionyx ocellatus) inhabit the rivers and frogs (Rana tigrina) are met with in abundance throughout the district. Two other protected species of reptiles which are amphibious and are occasionally seen in the Ramganga are the gharial (Gavialis gangelicus) and mugger (Crocodiles palustries) but ehir number is dwindling rapidly owing partly to the silting up of the bed of the river and partly to indiscriminate shooting.

1.6.3 FISH

The Ganga itself is not much visited by local fishermen but they regularly drag the backwaters and pools left by the annual floods. The fish market of Moradabad city mostly depends on the catch form the Ramganga. The small rivers and permanent jhils, in which fish are found in abundance, are fully exploited.

About 50 species of fish are found in the district. Of these the gonch (Bagarius bagarius), tangent (Mystus seenghala), rohu (Labeo rohita), bhakur (Catla catla), karaunch (Labeo calbasu), raiya (Cirrhina reba), saul (Ophiocephalus marulius) and patra (Notopterus notopterus) have a good market. The other species include parhan (Wallago attu), pabda (Callichorous bimaculatus), singhi (Heteropneustus fossilis), magur (Calrius batrachus), naraini or nain (Cirrhina mrigala), khursa (Labeo gonious), khurant (Labeo deso), mahasher (Barbus (Tor) putitora), darahi (Barbus sarana), chilwa (Chela bacaila, chela gora), chiria (Engraulis talara), hilsa (Hilsa ilisha), sawri or kawar (Ophiocephalus striatus), girai (Ophiocephalus punclatus), gachua (Ophiocephalus gachva), moh, moi or chital (Notopterus chitala), anwari (Mugil corsula), kharda (Ambassis nama), chanda (Ambassis ranga), kawai (Anbas testudinus), pathri or bhola (Sciaena coitor), guria (Bonius giuris), cuchia (Amohiphous cuchia), bean (Mastacembelus am\rmatus), and kauwa (Xenento cancila).

1.6.4 GAME-LAWS

The game laws obtained in the district are governed by the Wild Birds and Animals Protection, U.P. Amendment Act (Act No.XIII of 1934). In the reserved forest blocks of Mohammadpur Jatti (in Tehsil Amroha) and Sihali Jagir (in Tehsil Hasanpur), the Indian Forest Act of 1927 is also applicable in the district.

CHAPTER II

POPULATION AND LAND RESOURCES

2.1 POPULATION

As per Census figure of 1991, the district of Moradabad had 2.13 per cent share in total population of the state of Uttar Pradesh. Out of 2965293 persons, 68.57 per cent belonged to rural area and remaining 31.43 per cent were living in urban areas of the district. A gender-wise break-up of the total population further revealed that 54.08 per cent were male as against 45.92 per cent females during the year 1991 in the district of Moradabad.

The Scheduled Castes in total population of the district constituted 15.88 per cent whereas the proportion of ST population in the district was recorded to be quite low, i.e. only 0.01 per cent of the total population.

The sex-ratio of the district, which turned out to be 849 females per thousand of males was lower than the same at the state level (879 females per thousand of males) during the year 1991.

As far density of population is concerned, the district had high population density (779 persons per sq.km.) as against an average density of 473 persons per sq. km. at the state level (Table 2.1). There were 443068 households against 433124 residential houses in the district during the year 1991. Consequently a shortfall of residential accommodation for the existing population was recorded during this period. There has been a significant increase in population density of the district between the years 1981 and 1991. The population density which was 527 persons per sq.kms. has increased to 779 persons per sq. km. over a period of 10 years.

Table 2.1: **Population Characteristics of Moradabad District and U.P., Census 1991**

Sl.No.	Items	Moradabad	Uttar Pradesh	% of U.P.
1.	Population	2965293 (100.00)	139112000 (100.00)	2.13
2.	Male	1603625 (54.08)	74037000 (53.22)	2.17
3.	Female	1361668 (45.92)	65075000 (46.78)	2.09
4.	Rural	2033426 (68.57)	111506000 (80.16)	1.82
5.	Urban	931867 (31.43)	27606000 (19.84)	3.38
6.	Scheduled Castes	470746 (15.88)	29276455 (21.05)	1.61
7.	Scheduled Tribes	318 (0.01)	287901 (0.21)	0.11
8.	Sex Ratio	849	879	
9.	Density (Per Sq.Km.)	779	473	

Note: Figures in bracket indicate the percentage.
Source: Census Hand Book, 1990-91.

2.2 POPULATION IN AGE GROUP

Age-wise structure of population indicates around 15 per cent of the infant population in the district against lower than 14 per cent infant population at the state level. The percentage of infant in total population is recorded to be higher in rural than urban areas of the district and also at the state level.

The proportion of children in school going age (5-15 years) is recorded to be 28 per cent in the district of Moradabad as against 26.61 per cent of the same at the district level as per census figures of 1991. The population falling in the working age group is found to be 50.18 per cent of total population in the district as compared to 52.13 per cent of the same at the state level. The share of old age population in total, is seen to be varying from 6.41 per cent to 7 per cent in urban and rural areas of the district. The share of old-

age population in total is recorded to be marginally higher in rural and urban areas, taking into consideration the figures of the state average.

Table 2.2: **Age-wise Classification of Population in Moradabad and U.P.**

Age Group	Age Structure of Population of Moradabad District (1991)					Population of U.P. According to Various Age Group (1991) (Thousand)				
	Male	Female	Total	Rural	Urban	Male	Female	Total	Rural	Urban
0—04	231403 (14.43)	214327 (15.74)	445730 (15.03)	313758 (15.43)	131972 (14.16)	9790 (14.23)	9264 (14.23)	19054 (13.70)	15589 (13.98)	3465 (12.55)
05—09	237176 (14.79)	208744 (15.33)	445920 (15.04)	309691 (15.23)	136229 (14.62)	10604 (14.32)	9479 (14.57)	20083 (14.44)	16359 (14.67)	3724 (13.49)
10—14	206868 (12.90)	177834 (13.06)	384702 (12.97)	262109 (12.89)	122593 (13.15)	9234 (12.48)	7704 (11.84)	16938 (12.17)	13457 (12.07)	3481 (12.61)
15—19	163249 (10.18)	124729 (9.16)	287978 (9.71)	188702 (9.28)	99276 (10.65)	7358 (9.94)	5627 (8.65)	12985 (9.33)	10094 (9.05)	2891 (10.47)
20—24	125885 (7.85)	110567 (8.12)	236452 (7.97)	157997 (7.77)	78455 (8.42)	5822 (7.86)	5538 (8.51)	11360 (8.17)	8910 (7.99)	2450 (8.88)
25—29	112254 (7.00)	101717 (7.47)	213971 (7.22)	146813 (7.22)	67158 (7.21)	5253 (7.09)	4997 (7.68)	10250 (7.37)	8079 (7.24)	2171 (7.86)
30—39	184577 (11.51)	162175 (11.91)	346752 (11.69)	233844 (11.50)	112908 (12.12)	8692 (11.74)	8164 (12.54)	16856 (12.12)	13202 (11.84)	3654 (13.24)
40—49	134865 (8.41)	107980 (7.93)	242845 (8.19)	166741 (8.20)	76104 (8.17)	6687 (9.03)	5864 (9.02)	12551 (9.02)	10013 (8.98)	2538 (9.19)
50—59	89322 (5.57)	70807 (5.20)	160129 (5.40)	112652 (5.54)	47477 (5.09)	4661 (6.29)	3854 (5.92)	8515 (6.12)	7023 (6.30)	1492 (5.40)
60+	118026 (7.36)	82788 (6.08)	200814 (6.78)	141119 (6.94)	59695 (6.41)	5937 (8.03)	4584 (7.04)	10521 (7.56)	8781 (7.88)	1740 (6.30)
TOTAL	1603625 (100.00)	1361668 (100.00)	2965293 (100.00)	2033426 (100.00)	931867 (100.00)	74037 (100.0)	65075 (100.00)	139112 (100.00)	111506 (100.00)	27606 (100.0)

Note : Figures in bracket indicate the percentage.
Source: Census, 1990-91.

2.3 WORKING POPULATION

Out of total population of 2965293 in district Moradabad, 28.77 per cent is categorized as workers. The average proportion of total workers in population turns out to be 32.20 per cent at the state level during the same period (1990-91). As per Census figures 1990-91, 27.98 per cent were recorded as main workers and 0.78 per cent as marginal workers in the total population of the district.

Table 2.3: **Working Population in Moradabad District and U.P., Census 1990-91**

	Moradabad	Uttar Pradesh
Total Population	2965293 (100.00)	139112 (100.00)
Total Main Workers	829762 (27.98)	41361000 (29.73)
Total Marginal Workers	23230 (0.78)	3438000 (2.47)
Total Workers	852992 (28.77)	44799000 (32.20)

Note : Figures in bracket indicate the percentage.
Source: Census Hand Book, 1990-91.

Different categories of total main workers in the district further showed a highest share of cultivators in total main workers (49.89 per cent). About 16 per cent of the total main workers were recorded as agricultural labourers in the district of Moradabad during the year 1990-91. The involvement of workers in household and non-household industry constituted 3.28 per cent and 9.00 per cent of total main workers respectively. The engagement of workers in trade and commercial activities was found to be the level of 7.70 per cent. There was a nominal engagement of workers in industrial and mining categories (only 0.02 per cent) in the district. The construction activities commanded 1.29 per cent of the total main workers. The engagement of workers in activities like transport, storage and communication was recorded to the level of 3.14 per cent. As many as 9.49 per cent of total main workers were involved in other than activities listed above.

2.4 CLASSIFICATION OF WORKERS

A comparison of category-wise classification of workers in the district with the state average further showed a higher proportion of workers' engagement in household and non-household industry in the district. At the same time the proportion of cultivators and agricultural labourers was recorded to be of the lower order in the district as compared to

the state average. Thus, a comparatively higher proportion of workers were found engaged in traditional household and non-household industries.

Table 2.4: **Classification of Workers of Moradabad District and U.P., 1991 Census**

Category	Moradabad	Uttar Pradesh
Cultivators	413938 (49.89)	22031000 (53.26)
Agriculture Labourers	130323 (15.71)	7833000 (18.94)
Animal Husbandry and Plantation	4053 (0.49)	296000 (0.72)
Industry and Mining	138 (0.02)	35000 (0.08)
Household Industry	27262 (3.28)	997000 (2.41)
Non-Household Industry	74598 (8.99)	2208000 (5.34)
Constructions	10709 (1.29)	511000 (1.24)
Trade & Commerce	63926 (7.70)	2551000 (6.17)
Transport, Storage and Communication	26067 (3.14)	771000 (1.86)
Other Services	78748 (9.49)	4128000 (9.98)
Total Main Workers	829762 (100.00)	41361000 (100.00)

Note : Figures in bracket indicate the percentage of Total Main Workers.
Source: Census Hand Book, 1990-91.

2.5 LITERACY

A literacy rate of 30.9 per cent, as compared to 42 per cent at the state level was recorded in the district during the year 1990-91. The literacy among female was as low as only 19 per cent as against 40.8 per cent among males in the district during this period. A further break-up of literacy among rural and urban areas of the district showed that it was a low of 22.5 per cent in rural areas as against 48.8 per cent in urban areas. The district had even lower than half of literacy rate in rural areas as compared to the same

considering the state average. In urban areas also, literacy rate in the district was far lower as compared to state average. The literacy among rural female population was only 8.8 per cent in the district as against the same as 35 per cent at the state level. The rural male population had a literacy of only 33.8 per cent as against 45 per cent among rural male taking into consideration the figures of the state average.

Table 2.5 : **Literacy Rate in Moradabad and U.P., Census 1990-91**

Item	Moradabad	Uttar Pradesh
Population	30.9	41.60
Male	40.8	55.73
Female	19.0	25.31
Rural		
Male	33.8	52.05
Female	8.8	19.02
Total	22.5	36.66
Urban		
Male	56.3	69.98
Female	40.3	50.38
Total	48.8	61.00

Source: Census Hand Book, 1990-91.

2.6 LAND AVAILABILITY

It is a well known fact that the land resource is limited as against population, which is ever increasing. Any change in population is likely to affect availability of land resource in coming years. Population projection of the district and state, which have been undertaken taking into consideration past growth, indicated significant growth in population in the district as well as in the state. This in turn, has reduced the per capita availability of geographical area and net cultivated area. The estimation of land availability in coming years is undoubtedly an important exercise in order to frame need based land use policy.

Table 2.6: **Projected Population Growth in Moradabad District and U.P., 1990-91 to 2009-2010**

Year	Moradabad			Uttar Pradesh		
	Male	Female	Total	Male	Female	Total
1990-91	1603625	1361668	2965293	74036957	65075330	139112287
2000-01	1988801	1760829	3749630	87466301	78586558	166052859
2001-02	2021020	1805026	3826046	88367204	79891095	168258299
2002-03	2053239	1849223	3902462	89268107	81195632	170463739
2003-04	2085458	1893420	3978878	90169010	82500169	172669179
2004-05	2117677	1937617	4055294	91069913	83804706	174874619
2005-06	2149896	1981814	4131710	91970816	85109243	177080059
2006-07	2182115	2026011	4208126	92871719	86413780	179285499
2007-08	2214334	2070208	4284542	93772622	87718317	181490939
2008-09	2246553	2114405	4360958	94673525	89022854	183696379
2009-10	2278772	2158602	4437374	95574428	90327391	185901819

The population of district Moradabad which was 29.65 lakh during the year 1990-91 has gone up to 37.50 lakh by the year 2000-01 registering an annual growth of 2.65 per cent. As compared to this, the population growth at the state level was found to be low (1.94 per cent per annum). As per population projections, the population of the district which was estimated to be 37.50 lakhs during 2000-2001, as per Census figures, may go upto 44.37 lakhs by the year 2009-2010. In view of increase in population, the per capita availability of geographical area which was 0.10 hect. may go down to 0.085 hect. during the years 2000-2001 and 2009-2010 in the district of Moradabad (Table 2.7). The average per capita availability of geographical area at the state level too is likely to go down to 0.13 hect. from 0.15 hect. during the same period. On account of higher population growth in the district there has been a sharp decline in the per capita availability of geographical area. Per capita availability of geographical area in the district was found to be higher

(0.20 hect.) as compared to State average (0.17 hect.) during the year 1990-91. But the same was recorded to be lower in the district (0.10 hect.) as compared to the state average (0.15 hect.) during the year 2000-2001.

In case of per capita availability of cultivated area also, there has been a sharp decline in the district as compared to the state over the period under consideration. Per capita availability of cultivated area which was 0.17 hect. in the district during 1990-91 has declined to 0.09 hect. in 2000-2001. As per projection estimates the per capita availability of cultivated area is likely to go down upto 0.07 hect. by the end of 2009-2010 in the district (Table 2.7). However, the availability of the same is expected to remain marginally higher (0.09 hect.) taking into consideration the figures of the state average during the year 2009-2010.

Table 2.7. **Per Capita Land Availability of Reported Area and Net Cultivated Area in Moradabad District and U.P. : 1990-91 to 2009-2010**

Year	Estimated Population of Moradabad District	Per Capita Availability of Land		Estimated Population of Uttar Pradesh	Per Capita Availability of Land	
		Reported Area (Hect.)	Net Cultivated Area (Hect.)		Reported Area (Hect.)	Net Cultivated Area (Hect.)
1990-91	2965293	0.201	0.165	139112287	0.175	0.119
2000-01	3749630	0.100	0.085	166052859	0.146	0.101
2001-02	3826046	0.098	0.083	168258299	0.144	0.100
2002-03	3902462	0.096	0.081	170463739	0.142	0.099
2003-04	3978878	0.094	0.079	172669179	0.140	0.098
2004-05	4055294	0.093	0.078	174874619	0.138	0.097
2005-06	4131710	0.091	0.076	177080059	0.137	0.096
2006-07	4208126	0.089	0.074	179285499	0.135	0.095
2007-08	4284542	0.088	0.072	181490939	0.133	0.095
2008-09	4360958	0.086	0.070	183696379	0.132	0.094
2009-10	4437374	0.085	0.069	185901819	0.130	0.093

2.7 LAND HOLDINGS: NUMBER

As per available statistics relating to distribution of land holding under different sizes out of total available land holdings in the district of Moradabad more than 74 per cent holding were found under the category of marginal land holdings during the year 2000-2001. The share of small holding had constituted 14.62 per cent of the total holdings existed in the district during the same period. The share of medium and large holdings taken together stood at 11.34 per cent in the district. Thus, about ninety per cent holdings in the district fell in the category of marginal and small land holdings during the year 2000-2001. Almost same picture of distribution of existing land holdings appeared while taking into consideration the state average.

An analysis of projection trends in existing land holding distribution of the district indicated percentage increase in marginal land holding along with marginal decline in small, medium and large land holdings (Table 2.8). Almost same trend has also emerged at the state average level. The sharp increasing trend in population has led to fragmentation of existing land holdings particularly in the category of marginal land holdings. This trend has further increased because of land distribution among landless agricultural labourers in the state. All such type of land allotments, tend to increase land holdings under the category of marginal land holdings in the district.

Table 2.8: Changes in Number of Land Holdings in District Moradabad and Uttar Pradesh ; 1985-86 to 2009-2010

(in thousand)

Year	MORADABAD				UTTAR PRADESH			
	Marginal	Small	Medium & large	Total	Marginal	Small	Medium & large	Total
1985-86	268 (64.27)	80 (19.18)	69 (16.55)	417 (100.00)	13782 (72.59)	2964 (15.61)	2239 (11.80)	18985 (100.00)
1990-91	314 (65.01)	97 (20.08)	72 (14.91)	483 (100.00)	14819 (73.82)	3118 (15.53)	2137 (10.65)	20074 (100.00)
1995-96	361 (70.93)	82 (16.11)	66 (12.96)	509 (100.00)	15574 (75.59)	2983 (14.48)	2046 (9.93)	20603 (100.00)
2000-01	379 (74.04)	74.85 (14.62)	58.05 (11.34)	511.90 (100.00)	15017.55 (74.49)	3103.25 (15.39)	2038.90 (10.12)	20159.70 (100.00))
2001-02	382.60 (74.66)	73.42 (14.33)	56.46 (11.02)	512.48 (100.00)	15057.26 (74.63)	3100.30 (15.37)	2019.28 (10.00)	20176.84 (100.00)
2002-03	386.20 (75.28)	71.99 (14.03)	54.87 (10.69)	513.06 (100.00)	15096.97 (74.76)	3097.35 (15.34)	1999.66 (9.90)	20193.58 (100.00)
2003-04	389.80 (75.89)	70.56 (13.74)	53.28 (10.37)	513.64 (100.00)	15136.68 (74.89)	3094.40 (15.31)	1980.04 (9.80)	20211.12 (100.00)
2004-05	393.40 (76.50)	69.13 (13.45)	51.69 (10.05)	514.22 (100.00)	15176.39 (75.03)	3091.45 (15.28)	1960.42 (9.69)	20228.26 (100.00)
2005-06	397 (77.12)	67.70 (13.15)	50.10 (9.73)	514.80 (100.00)	15216.10 (75.16)	3088.50 (15.25))	1940.80 (9.59)	20245.40 (100.00)
2006-07	400.60 (77.73)	66.27 (12.86)	48.51 (9.41)	515.38 (100.00)	15255.81 (75.29)	3085.55 (15.23)	1921.18 (9.48)	20262.54 (100.00)
2007-08	404.20 (78.34)	64.84 (12.57)	46.92 (9.09)	515.96 (011.00)	15295.52 (75.42)	3082.60 (15.20)	1901.56 (9.38)	20279.68 (100.00)
2008-09	407.80 (78.95)	63.41 (61.98)	45.33 (8.78)	516.54 (100.00)	15335.23 (75.55)	3079.65 (15.17)	1881.94 (9.27)	20296.82 (100.00)
2009-10	411.40 (79.56)	61.98 (11.98)	43.74 (8.46)	517.12 (100.00)	15374.94 (75.68)	3076.70 (15.15)	1862.32 (9.17)	20313.96 (100.00)

Note : Figures in bracket indicate the percentage

2.8 LAND HOLDINGS: AREA

The proportion of area under marginal and small holdings was recorded to be far lower as compared to their proportionate number in total holdings of the district Moradabad during the year 2000-2001. About 60 per cent of total land holding areas was found existing in the group of marginal and small land holdings during this period. There has been a consistent rise in the area under small and marginal land holding since the year 1985-86 in the district (Table 2.8). As per estimates the area under marginal and small holdings is further likely to go up to about 69 per cent by the year 2009-2010. At the same time, area under large land holdings, which was recorded to be the 1.64 per cent of the total holdings during the year 2000-2001 may further decline to about 1.27 per cent of the total holdings by the year 2009-2010. There has already been a proportionate reduction in area of the same from 2.80 per cent in 1985-86 to 1.64 per cent of total reported area during the year 2000-2001 in the district. A simultaneous decline in the area of medium group of land holdings was also observed during this period. These share of medium land holdings area which was about 51 per cent of the total area during the year 1985-86 further went down to about 39 per cent during the year 2000-2001. It may further go down to about 30 per cent by the year 2009-2010 as per projection estimates. Presently the district has smaller proportion of area under large land holdings as compared to the state average figures.

Table 2.9: **Land Area Under Different Holdings in District Moradabad and Uttar Pradesh: 1985-1986 to 2009-2010**

(Thousand Hectares)

Year	Moradabad						Uttar Pradesh					
	Marginal	Small	Semi-Medium	Medium	Large	Total	Marginal	Small	Semi-Medium	Medium	Large	Total
1985-86	104.60 (22.76)	110.30 (24.00)	140.50 (30.57)	91.30 (19.87)	12.90 (2.80)	459.60 (100.0)	4993.3 (28.29)	4114.9 (23.32)	4313.1 (24.44)	3377.4 (19.14)	849.5 (4.81)	17648.2 (100.0)
1990-91	121.00 (23.48)	141.60 (27.48)	144.30 (28.00)	98.00 (19.02)	10.4 (2.02)	515.30 (100.0)	5653.3 (31.43)	4390.7 (24.41)	4206.7 (23.39)	3042.0 (16.91)	694.0 (3.86)	17986.7 (100.0)
1995-96	155.1 (31.19)	117.9 (23.71)	131.70 (26.48)	83.40 (16.77)	9.20 (1.85)	497.30 (100.0)	6023.4 (34.02)	4214.5 (23.81)	4101.30 (23.17)	2799.7 (15.82)	562.30 (3.18)	17701.2 (100.0)
2000-01	198.8 (40.06)	98.15 (19.78)	120.20 (24.22)	71.00 (14.30)	8.15 (1.64)	496.30 (100.0)	6644.7 (37.04)	4265.05 (23.78)	4000.80 (22.30)	2560.35 (14.27)	467.30 (2.61)	17938.2 (100.0)
2001-02	207.54 (41.83)	94.20 (18.99)	117.90 (23.77)	68.52 (13.81)	7.94 (1.60)	496.10 (100.0)	6768.96 (37.64)	4275.16 (23.77)	3980.70 (22.13)	2512.48 (13.97)	448.30 (2.49)	17985.6 (100.0)
2002-03	216.28 (43.61)	90.25 (18.20)	115.60 (23.31)	66.04 (13.32)	7.73 (1.56)	495.90 (100.0)	6893.22 (38.23)	4285.27 (23.76)	3960.60 (21.96)	2464.61 (13.67)	429.30 (2.38)	18033.0 (100.0)
2003-04	225.02 (45.39)	86.30 (17.41)	113.30 (22.86)	63.56 (12.82)	7.52 (1.52)	495.70 (100.0)	7017.48 (38.81)	4295.38 (23.76)	3940.50 (21.79)	2416.74 (13.37)	410.30 (2.27)	18080.4 (100.0)
2004-05	233.76 (47.18)	82.35 (16.62)	111.00 (22.40)	61.08 (12.33)	7.31 (1.47)	495.50 (100.0)	7141.74 (39.40)	4305.49 (23.75)	3920.40 (21.63)	2368.87 (13.06)	391.30 (2.16)	18127.8 (100.0)
2005-06	242.50 (48.96)	78.40 (15.83)	108.70 (21.95)	58.60 (11.83)	7.10 (1.43)	495.30 (100.0)	7266.0 (39.98)	4315.60 (23.74)	3900.30 (21.46)	2321.00 (12.77)	372.30 (2.05)	18175.2 (100.0)
2006-07	251.24 (50.75)	74.45 (15.04)	106.40 (21.49)	56.12 (11.33)	6.89 (1.39)	495.10 (100.0)	7390.26 (40.56)	4325.71 (23.74)	3880.20 (21.29)	2273.13 (12.47)	353.30 (1.94)	18222.6 (100.0)
2007-08	259.98 (52.53)	70.50 (14.25)	104.10 (21.03)	53.64 (10.84)	6.68 (1.35)	494.90 (100.0)	7514.52 (41.13)	4335.82 (23.73)	3860.10 (21.13)	2225.26 (12.18)	334.30 (1.83)	18270.0 (100.0)
2008-09	268.72 (54.32)	66.55 (13.45)	101.80 (20.58)	51.16 (10.34)	6.47 (1.31)	494.70 (100.0)	7638.78 (46.70)	4345.93 (23.73)	3840.00 (20.96)	2177.39 (11.89)	315.30 (1.72)	18317.4 (100.0)
2009-10	277.46 (56.11)	62.60 (12.66)	99.50 (20.12)	48.68 (9.84)	6.26 (1.27)	494.50 (100.0)	7763.04 (42.27)	4356.04 (23.72)	3819.90 (20.80)	2129.12 (11.60)	296.30 (1.61)	18364.8 (100.0)

Note : Figures in bracket indicate the percentage.
Source: Sankhyakiya Patrika.

2.9 CONCLUSION

The total population of the district was found to be divided in urban and rural areas in the proportion of 31.43 per cent and 68.57 per cent respectively. The Scheduled Castes in total population of the district constituted 15.88 per cent whereas the proportion of Scheduled Tribes population was recorded to be quite low. The sex ratio of the district was marginally lower (849 females per thousand of males) as compared to the state average. The district had a high population density as against the same at the state average level. There was a shortfall of residential accommodation for the existed population of the district during the year 1990-91.

The population falling in the working age group was 50.18 per cent of the total population in the district which turned out to be lower than the state average (52.13 per cent). About 29 per cent of the district population was categorized under working population group as per Census 1990-91 figures. A higher share of cultivators (49.89 per cent) in total main workers along with 16 per cent as agricultural labourers was also recorded during the same period in the district. A comparatively higher proportion of workers were found engaged in traditional household and non-household industries in the district. The district had a lower literacy rate of 30.9 per cent as compared to 42 per cent at the state level during the year 1990-91.

Per capita availability of geographical area in the district was found to be the higher as compared to the state average during late eighties, which further went down in the district as compared to the state during the year 2000-2001. In case of per capita availability of cultivated area also, there has been a sharp decline in the district as compared to the state over the period of 15 years or so. As per projection estimates per

capita availability of cultivated area may further go down by the year 2009-2010. However, the availability of the same is likely to remain marginally higher in the district as compared to the state average during the same period.

About 90 per cent holdings in the district fall in the category of marginal and small land holdings on the lines of the figures of the same at the state average. The sharp increasing trend in the population has led to fragmentation of existing land holdings particularly among marginal and small ones. This trend has further increased due to land distribution among landless agricultural labourers in the district in particular and in the state in general. The proportion of area under marginal and small land holdings was recorded to be far lower as compared to the proportionate number of holdings under these categories in the district. The share of area under medium land holdings has gone down in the district over the years 1985-86 and 2000-2001. Presently, the district has smaller proportionate area under large holdings as compared to the figures of the state average.

CHAPTER III

TRENDS AND PROJECTIONS OF LAND USE PATTERN

3.1 INTRODUCTION

Land use pattern has important implications for the economic growth and environmental balance of any area/region. The present chapter discusses the land use pattern and trends in the district of Moradabad. The analysis is based upon the Revenue Board data providing information for different years about the area under nine land use categories. The data have been taken from the Bulletin of Agricultural Statistics published annually by the Directorate of Agriculture, U.P. The analysis broadly covers the period 1980-81 to 2000-2001. The data for the years 1980-81, 1985-86, 1990-91, 1995-96 and 2000-2001 have been taken into consideration for analyzing the changes in pattern and trends of land use.

3.2 TRENDS IN LAND USE PATTERN

Table 3.1 shows a significant difference in reporting area of the district between the years 1995-96 and 2000-2001. The reporting area of the district which was 5.97 lakh hectares has gone down to 3.76 lakh hectares during the reference year 2000-01. The sharp decline in reported area has taken place because of transfer of districts area to form a new district, namely Jyotiba Phule Nagar. As a result of transfer of district area, the forest cover which was around two per cent for many years has further gone down to 0.06 per cent of the total reported area during the year 2000-01.

The area under the category of barren land, which was recorded to be the 2.52 per cent of the total reporting area, increased marginally during 1985-86. It was found reducing in successive years and found reduced to the level of less than one per cent during the year 1995-96. But the same has increased marginally (1.17 per cent) by the end of the year 2000-01. However, an overall pattern of barren land showed a reducing trend over the years in the district of Moradabad.

There was found to be a general tendency of increased land proportion under non-agricultural uses throughout the state. In case of Moradabad also, the share of land put to non-agricultural uses has kept on increasing from below 8 per cent in 1980-81 to about 10 per cent during the year 2000-01. Population growth, rural-urban migration, industrialisation and consequent urbanisation are the main reasons for the same.

Area under culturable waste, which was 1.88 per cent of the reporting area has kept on reducing in the district over the years and finally was observed to be constituting only 0.43 per cent of total reporting area during the year 2000-01. The area under current fallow and other fallow also were seen to be going down. The share of area under current fallow which was 3.08 per cent came down to 2.54 per cent, 2.31 per cent and 2.25 per cent of the reporting area during the years 1985-86, 1990-91 and 1995-96 respectively. The same has further come down to around 2 per cent during the year 2000-01. In case of other fallows, the share of area has gone down to 0.70 per cent from 1.12 per cent of the reporting area over the years 1980-81 and 2000-01.

The area under pasture land, which was already quite low (0.17 per cent) in the district, has further gone down in successive years and finally found to be only 0.10 per cent of the reporting area during the year 2000-01. The share of area under miscellaneous

trees and groves which was initially recorded to be only 0.41 per cent during 1980-81 grew to 0.53 per cent, 1.0 per cent during the years 1985-86 and 1990-91 respectively. But it has started reducing to 0.95 per cent and 0.61 per cent in successive years, i.e. 1995-96 and 2000-01.

A marginal reduction in the area under culturable waste and fallow lands led to an increase in net cultivated area of the district Moradabad. The net sown area which was 80.90 per cent of the total reporting area has increased to about 85 per cent by the end of the year 2000-01. An over view of the land use pattern of the district present an alarming picture in case of forest cover which turns out to be less than one per cent.

Table 3.1: **Trends and Projections of Land Use**

Land Use Category	1980-81	1985-86	1990-91	1995-96	2000-2001
Reporting Area	592632 (100.00)	593479 (100.00)	595421 (100.00)	596878 (100.00)	375865 (100.00)
Forest	11921 (2.01)	11921 (2.01)	11922 (2.00)	11921 (2.00)	223 (0.06)
Barren Land	14959 (2.52)	15315 (2.58)	12418 (2.09)	5731 (0.96)	4389 (1.17)
Land Under Non-Agricultural Uses	46897 (7.91)	46695 (7.87)	47571 (7.99)	52380 (8.78)	37418 (9.96)
Culturable Waste	11126 (1.88)	9654 (1.63)	7238 (1.22)	12492 (2.09)	1602 (0.43)
Permanent Pasture	985 (0.17)	1011 (0.17)	732 (0.12)	710 (0.12)	358 (0.10)
Miscellaneous trees	2419 (0.41)	3116 (0.53)	6176 (1.04)	5676 (0.95)	2306 (0.61)
Current Fallow	18253 (3.08)	15100 (2.54)	13786 (2.31)	13437 (2.25)	7683 (2.04)
Other Fallow	6650 (1.12)	8282 (1.39)	6395 (1.07)	7483 (1.25)	2647 (0.70)
Net Area Sown	479422 (80.90)	482385 (81.28)	489183 (82.16)	487048 (81.60)	319239 (84.93)

Note: Figures in bracket indicate the percentage.

3.3 PERIOD-WISE SHIFT IN AREA UNDER DIFFERENT LAND USE CATEGORIES

As stated earlier, there was a sudden fall of more than 50 per cent in the reported area of the distract after the year 1995-96. This was on account of creating new district – Jyotiba Phule Nagar – which absorbed a major part of Moradabad. Before this, there has been a marginal increase in the reporting area of the district. Table 3.2 showed 0.14 per cent increase in reporting area between the years 1980-81 and 1985-86. Like-wise there was an increase of 0.33 per cent in the same during 1985-86 and 1990-91. An increase of 0.24 per cent was further witnessed in the district's reporting area between the years 1990-91 and 1995-96.

The share of area under forest remained almost constant from the reference year till the year 1995-96. Therefore, there was a sudden drop of 11698 hectares in forest area of the district between the years 1995-96 and 2000-2001. Thus, a major area under forest was shifted in newly created district which resulted in a sharp decline of district's forest area. The data relating to area under miscellaneous trees and groves showed that there has been an increment of 22.37 per cent and 49.55 per cent in the area under this category between the years 1980-81 to 1985-86 and 1985-86 to 1990-91 respectively. But the same has gone down by about 9 per cent between the years 1990-91 and 1995-96. It has further gone above by more than 146 per cent over the years 1995-96 to 2000-2001. Thus, the overall data relating to forest area and area under trees and groves has shown a drastic reduction during last five years in the district of Moradabad.

The area under barren land has increased by 2.32 per cent between the years 1980-81 and 1985-86 but subsequently kept on decreasing till 2000-01. A reduction of 23.33

per cent in barren land was recorded between the years 1985-86 and 1990-91. It was further found to be declining by 116.68 per cent during 1995-96 over 1990-91. Lastly a reduction of 30.58 per cent was witnessed during 2000-2001 over 1995-96.

Land put to non-agricultural uses was also seen to be declining by 0.43 per cent between the years 1980-81 and 1985-86 in the district of Moradabad. But later on it was found to be increasing by 1.84 per cent and 9.18 per cent in the subsequent periods of 1985-86 to 1990-91 and 1990-91 to 1995-96. The share of land used for non-agricultural purposes reduced by 40 per cent between the years 1995-96 and 2000-01. In fact there was no reduction in area put to non-agricultural uses during this period. Land area falling in this category was shifted to newly created district.

The area under cultivable waste was observed to be reducing between 1980-81 to 1990-91, but later on it was found to be increasing during the years 1990-91 and 1995-96. Subsequently, the same has gone down drastically due to bifurcation of the district (Table 3.2). A perusal of data relating to current fallow and other fallow land showed that there was a continuous decline in area under current fallow throughout the reference period (i.e. 1980-81 to 200-01), but area under other fallow grew at about 20 per cent and 15 per cent over the years 1980-81 to 1985-86 and 1990-91 to 1995-96 respectively. In case of permanent pasture land, there was a marginal increase of 2.57 per cent during the years 1980-81 and 1985-86, but later on it went on decreasing till 2000-01.

Net cultivated area in the district was seen to be growing by 0.61 per cent and 1.39 per cent between the years 1980-81 to 1985-86 and 1985-86n to 1990-91. But after this period, there was a fall of 53 per cent in net cultivated area of Moradabad.

Table 3.2: **Period-wise Shift in Area Under Different Land Use Categories in District Moradabad, 1980-1981 to 2000-2001**

Land Use Category	1985-86 over 1980-81	1990-91 over 1985-86	1995-96 over 1990-91	2000-01 over 1995-96
Reporting Area	847 (0.14)	1942 (0.33)	1457 (0.24)	-221013 (-37.03)
Forest	--	1 (0.0084)	-1 (-0.01)	-11698 (-98.13)
Barren Land	356 (2.38)	-2897 (-18.92)	-6687 (-53.85)	-1342 (-23.42)
Land Under Non-Agricultural Uses	-202 (-0.43)	876 (1.88)	4809 (10.11)	-14962 (-28.56)
Culturable Waste	-1472 (-13.23)	-2416 (-25.03)	5254 (72.59)	-10890 (-87.18)
Permanent Pasture	26 (2.64)	-279 (-27.60)	-22 (-3.01)	-352 (-49.58)
Miscellaneous trees	697 (28.81)	3060 (98.20)	-500 (-8.10)	-3370 (-59.37)
Current Fallow	-3153 (-17.27)	-1314 (-8.70)	-349 (-2.53)	-5754 (-42.82)
Other Fallow	1632 (24.54)	-1887 (-22.78)	1088 (17.01)	-4836 (-64.63)
Net Area Sown	2963 (0.62)	6798 (1.41)	-2135 (-0.44)	-167809 (-34.45)

Note: Figures in bracket indicate the percentage.

3.4 GROWTH RATES OF AREA UNDER DIFFERENT LAND USE CATEGORIES

The growth of total geographical area in the district of Moradabad was marginal (0.05 per cent) during eighties but the same grew at 15.84 per cent during 1990-91 and 2000-01. An overall negative growth of 2.88 per cent was witnessed taking into consideration the period beginning from the year 1980-81 to 2000-01. The growth of area under forest was almost constant between the years 1980-81 and 1990-91. A negative growth of 524.62 per cent was witnessed in the forest area of the district during 1990-91 to 2000-01. Overall growth of reference period (i.e. between 1980-81 to 2000-01) in

forest area of the district was – 269.29. Thus, there was a sharp decline in the area under forest in Moradabad during this period. As compared to forest area, the land under miscellaneous trees grew at 6.08 per cent rate during 1980-81 and 1990-91. It was seen to be declining at 16.78 per cent during 1990-91 and 2000-01 in the district. However, an overall decline in the area under this category showed a negative growth of less than one per cent (Table 3.3).

In case of barren land there was a constant decline in growth. It was only -2.05 per cent during 1980-81 and 1990-91. A decline of 18.24 per cent was observed in area under barren land during the decade 1990-91 and 2000-01 in the district. The barren land declined at 12.04 per cent rate taking into consideration the years 1980-81 to 2000-01.

The growth of area put under non-agricultural uses was seen to be positive (0.14 per cent) during 1980-81 and 1990-91 but it was found to be negative (2.71 per cent) during 1990-91 to 2000-01. An overall decline of 1.27 per cent in area under this category was found during the reference period. Area under cultivable waste has also declined during 1980-81 to 1990-91 and 1990-91 to 2000-01. It has declined at a faster rate during the later period. An overall decline of 29.73 per cent was found in area under this category.

There was a constant decline in area under pasture land, current fallow, other fallow and net area sown during both the periods. An overall declining growth was observed in all these land use categories during 1980-81 and 2000-01. However, the highest decline was observed in case of permanent pasture followed by area under other fallowed and current fallow.

Table 3.3: **Growth Rate in Area Under Different Land Use Categories in Moradabad District**

Land Use Category	1980-81 to 1990-91	1990-91 to 2000-01	1980-81 to 2000-01
Reporting Area	0.05	-3.69	-1.83
Forest	0.001	-9.81	-4.91
Barren Land	-1.70	-6.47	-3.53
Land Under Non-Agricultural Uses	0.14	-2.13	-1.01
Culturable Waste	-3.49	-7.79	-4.28
Permanent Pasture	-2.57	-5.11	-3.18
Miscellaneous trees	15.53	-6.27	-0.23
Current Fallow	-2.45	-4.43	-2.90
Other Fallow	-0.38	-5.86	-3.01
Net Area Sown	0.20	-3.47	-1.67

3.5 PROJECTED AREA UNDER DIFFERENT LAND USE CATEGORIES

In this section an attempt is made to project the land area under different categories taking into consideration the past trend in each category. As per projection estimates the share of area under forest is likely to grow up from present 0.06 per cent to 0.47 pr cent of the total reporting area by the end of the year 2009-10. Like-wise area under barren land which is recorded to be 1.17 per cent of the reporting area is also likely to grow and expected to be more than 2 per cent by the year 2009-10 (Table 3.4).

Considering the past growth of land under non-agricultural uses, it is likely to constitute more than 12 per cent of the total reporting area. However, area under culturable waste is likely to go down from 0.43 per cent to 0.15 per cent of the total reporting area during the same period. The area under pasture land which is recorded to be merely 0.10 per cent in the district is expected to remain same by the end of the year 2010 if proper measures are not adopted. In case of area under miscellaneous trees and

groves which was 0.61 per cent of the reported area during 2000-01 expected to marginally go down to 0.45 per cent by the year 2009-10. Taking into consideration marginal increase in districts area under forest, it is expected that overall green cover of the district is likely to remain constant in the years to come. In view of population growth and consequent urbanisation, this may prove to be hazardous from the point of view of environmental pollution in the area.

Table 3.4 : **Projected Area Under Different Land Use Classes**

Land Use Category	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
Reporting Area	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)
Forest	223 (0.06)	354 (0.09)	526 (0.14)	761 (0.20)	949 (0.25)	1140 (0.30)	1346 (0.36)	1589 (0.42)	1671 (0.44)	1762 (0.47)
Barren Land	4389 (1.17)	4468 (1.18)	4565 (1.21)	4961 (1.32)	5450 (1.45)	5976 (1.59)	6540 (1.74)	7104 (1.89)	7592 (2.02)	8117 (2.16)
Land Under Non-Agricultural Uses	37418 (9.96)	38361 (10.21)	39154 (10.42)	39654 (10.55)	40142 (10.68)	40669 (10.82)	41383 (11.01)	43149 (11.48)	44690 (11.89)	45179 (12.02)
Culturable Waste	1602 (0.43)	1505 (0.40)	1380 (0.37)	1250 (0.33)	1120 (0.30)	1005 (0.27)	892 (0.24)	784 (0.21)	684 (0.18)	572 (0.15)
Permanent Pasture	358 (0.10)	359 (0.10)	360 (0.10)	361 (0.10)	362 (0.10)	363 (0.10)	364 (0.10)	365 (0.10)	366 (0.10)	367 (0.10)
Miscellaneous trees	2306 (0.61)	2232 (0.59)	2160 (0.57)	2091 (0.56)	2024 (0.54)	1959 (0.52)	1895 (0.50)	1830 (0.49)	1765 (0.47)	1698 (0.45)
Current Fallow	7683 (2.04)	7913 (2.11)	8202 (2.18)	8469 (2.25)	8693 (2.31)	9010 (2.40)	9337 (2.48)	9575 (2.55)	9813 (2.61)	10043 (2.67)
Other Fallow	2647 (0.70)	2596 (0.69)	2546 (0.68)	2497 (0.66)	2459 (0.65)	2411 (0.64)	2364 (0.63)	2307 (0.61)	2250 (0.60)	2193 (0.59)
Net Area Sown	319239 (84.93)	318077 (84.63)	316972 (84.33)	315821 (84.03)	314666 (83.72)	313332 (83.36)	311744 (82.94)	309162 (82.25)	307034 (81.69)	305934 (81.39)

Note: Figures in brackets indicate the percentage.

Considering the past trend of the area under fallow land, no major change is expected in area under this category in the years to come. In fact, a marginal increment in area under current fallow and a simultaneous marginal decline in other fallow land may result in almost same area under this category. Owing to constant area under fallow land and increasing use of area under non-agricultural uses, a marginal decline in net sown area is also expected. The net cultivated area which was 84.93 per cent of the reported area may go down to 81.40 per cent by the year 2009-10.

3.6 CONCLUSION

A perusal of trends of land use pattern during the years 1980-81 to 2000-01 indicated a reduced share of forest area in the district. This was found mainly because of withdrawal of substantial area from the district in course of creation of new district. Under this process a major portion of district forest area also merged in other district.

A marginal reduction in barren land was observed along with increased land under non-agricultural uses during the reference period in the district. There was a reduced area under culturable waste and permanent pasture, miscellaneous trees. There was a simultaneous reduction in fallow land which resulted in a marginal increase in net sown area of the district. There was an overall reduction in area under different categories particularly between the years 1995-96 and 2000-01. However, there was a positive shift in area under non-agricultural uses during 1990-91 and 1995-96 in the district. The projection of area under different categories indicated an insufficient increase in the forest area along with the reduced area under trees and groves. The barren land is also likely to go up as per past trends. Land put to non-agricultural uses is likely to grow significantly. The fallow land along with pasture area will remain almost constant in the years to come.

All this may bring about a marginal decline in net sown area of the district. The picture of the likely land use pattern in the years to come depicted in this section, calls for a major shift in policy regime relating to land use pattern. There is need to shift more area under green cover along with reduced barren and fallow land in the district.

CHAPTER IV

IDENTIFICATION OF PLANNING AREAS

An analysis of existed land use pattern of the district Moradabad indicated that there has been an unplanned utilization of land for different purposes. Out of nine-fold uses, some have been used which have affected severely in standard norms. In other cases also, the use of land has not been found as per norms. In order to achieve the balanced land use under different categories, formulation of land use plan with proper identification of areas for different purposes is earnestly required. The present chapter makes an attempt to present an analysis of so far existed land use pattern in each of the nine classifications in order to determine their future uses under Model Planning in Moradabad district.

4.1 LAND UNDER FOREST

The forest area of the State has suffered a severe loss with the creation of new State of Uttaranchal from Uttar Pradesh. Even before formulation of the State of Uttaranchal, area under forest has been far lower than the standard norm in most of the districts falling in the plain areas of the State. The land area under forest in Moradabad district has been far lower as compared to the norm of 30 per cent share of forest area in the reported area as recommended under the National Forest Policy. In view of the progress of the State Forest Department regarding the efforts to increase the forest area in different districts of the State, the possibilities of increasing the forest area of the district Moradabad was explored. In course of the discussion with the officials of the Forest Department, it was not found practical as well as possible to increase the forest area of the

district to the level of 30 per cent of the reported area in the forthcoming years. It was found desirable that every efforts should be made to increase the afforestation in the district area in the years to come by diverting land from other uses in a planned manner.

4.2 BARREN LAND

There has been appreciable reduction in the area under barren land over the years 1980-81 and 2000-2001 in the district of Moradabad. The share of barren land in the total reported area which was 2.52 per cent has gone down to 1.17 per cent during this period. But the district has still a sizeable area under barren land which amounted to 4389 hectares during the year 2000-2001. Such a large area of barren land necessarily requires proper plan to utilize the same in the years to come. As per estimates made by the officials of Department of Agriculture, around 35 per cent of the total barren land in most of the districts is considered to be rocky and hence not worth using with the given level of technology of barren land reclamation. In order to reclaim and putting under different uses the remaining 65 per cent barren land, Department of Agriculture and World Bank sponsored Sodic Land Reclamation Projects are in operation. Having considering the capacity and possibility of reclaiming the existing barren land, it will be decided as to how much area from the existing barren land can be treated to be used under different categories.

4.3 LAND UNDER NON-AGRICULTURAL USES

The share of land used for non-agricultural purposes is found to be comparatively low in the district considering other districts of the State, yet it has been increasing from 7.91 per cent to about 10 per cent of the total reported area over the last twenty years.

The increment in the area under non-agricultural uses in the district has resulted as an outcome of the process of urbanisation and industrial development. Rural urban migrations coupled with increased population are the important reasons for the same and may be considered as a positive sign and natural growth process in the present circumstances. Around 10 per cent of the reported area in Moradabad district is recorded under non-agricultural uses during the year 2000-2001 and there is every likelihood that this share of area will increase in forthcoming years. Considering the need for bringing more area under non-agricultural uses, clearance of land for these purposes is to be met from other categories of land. As it is observed in the past, generally agricultural land has been diverted for non-agricultural uses. Taking into consideration the past trend in this respect, rate of growth in the area for non-agricultural uses is to be planned. The possibility of using the non-agricultural area for other purposes may also be sought in this respect.

4.4 CULTURABLE WASTE

The area under culturable waste was recorded to be quite low in the district as compared to other districts of the state during the year 2000-2001. Its share in the total reported area was recorded to be as low as only 0.43 per cent during this period. Over the last twenty years the share of culturable waste in total reported area has been around 2 per cent. In view of the constant growth in the demand of land for different purposes, the area of culturable waste can be utilized for cultivation, for increasing forest cover and for non-agricultural purposes. Therefore, the proposed Model Land Use Plan also presents the scheme for bringing the culturable waste land under different possible uses during the coming years.

4.5 PERMANENT PASTURE LAND

There has been very low share of area in total reported area under pasture land in the district for last twenty years. The share of area under this category which was around 0.17 per cent has further gone down to 0.10 per cent during the years 1980-81 and 2000-2001. In view of the existing livestock population of the district, any further reduction in the area under pasture land would not be permissible. Therefore, in the proposed Model Land Use Plan of Moradabad district, area under pasture land would not be diverted for any other uses. Pasture land would be proposed in this plan to remain at least at its existing level in the forthcoming years.

4.6 AREA UNDER MISCELLANEOUS TREES

The area under miscellaneous trees has been increasing marginally over the past twenty years in the district of Moradabad. But for the last five years there has been a declining in the area. This calls for need of bringing more district's area under tree cover. The area under miscellaneous trees includes the area of old orchards, new orchards and scattered trees. Any reduction in area under these, may have severe adverse environmental impact. In view of this, in order to protect environment as well as afforestation, plan proposes that any further decline in the area of miscellaneous trees would be restricted and existing area will be protected.

4.7 FALLOW LAND

The combined area of both type of fallows in the district constituted around 2.75 per cent of the total reported area during the year 2000-2001. There has been a consistent decline in fallow area of the district over the last 20 years. A high share of the current

fallow as compared to the other fallow land constituted more than 2 per cent of the district's reported area during the year 2000-2001. In the proposed model land use plan an attempt has been made to devise a methodology for the management of fallow land in order to use it for cultivation and other purposes.

4.8 NET AREA SOWN

There has been a very high share of net sown area in the total reported area in the district. The net sown area has been increasing in the district for last twenty years. The proportion of the same in the reported area has increased from around 81 per cent during the year 1980-81 to about 85 per cent during 2000-2001. Despite a high proportion of net sown area, there has not been a balanced growth of other land uses in the district for last many years. There is a need to plan the district's other land uses such as forest, barren land, culturable waste, fallow land and land under non-agricultural uses. It is, therefore, needed that a plan be proposed to rearrange the net sown area along with other land uses for the future in the district.

On the basis of above, following seven (7) categories of land uses in the district require planning for their optimum and realistic utilization upto the year 2009-2010:

(i) Planning for Forest Area.
(ii) Planning for Barren Land.
(iii) Planning for Land under Non-Agricultural Uses.
(iv) Planning for Culturable Waste.
(v) Planning for Current Fallow.
(vi) Planning for Other Fallow.
(vii) Planning for Net Area Sown.

CHAPTER – V

LAND USE PLANNING OF MORADABAD DISTRICT

The trends in land use pattern of the district Moradabad covering the years from 1980-81 to 2000-2001, which were analyzed in the earlier section of the study revealed the changes in the status of different land uses under various categories during this period. A study of land use trends indicated unsystematic and abrupt utilization of land for various purposes. In view of these, there is a need to prepare a proper plan for the need based use of land for various purposes. For example on the one hand there was a constant increment in the area under cultivation but at the same time the forest cover was seen to be almost eliminating from the district. All these called for the need to prepare a composite plan for the use of land for various purposes in each of the nine-fold classification of land use. The proposed plan is expected to remain realistic not utopian one to be appropriate for the future implementation. Taking care of all above mentioned problems, a model land use plan for the development of different land uses in district Moradabad has been presented here.

5.1 PLAN FOR FOREST DEVELOPMENT

The forest cover of the district Moradabad was confined to around 2 per cent over the years 1980-81 and 1995-96. It has further gone down to 0.06 per cent of the total reported area by the year 2000-2001. Apportioning of district's land area to newly carved out adjoining district has been the major reason for sudden drop in the forest area of the district. This is found to be quite lower while considering the recommended norms for

minimum forest cover under National Forest Policy. There have been serious efforts from the side of the State Forest Department to increase the forest area in the district along with different other districts of the State, still it was not found feasible to increase the forest area of the district to a higher percentage of the total reported area in forthcoming years. However, need was felt in this connection to divert land from other uses to enhance the district's afforestation by increasing tree cover through a proper planning. Hence onwards concerted efforts are needed to increase the forest area keeping in view the financial and administrative considerations. Another important aspect of this planning is that the future plan to increase forest area does not mean increasing the area reserved for forest alone but a higher emphasis is proposed to increase tree cover rather than forest cover. In view of the given limitations, there are much possibilities to increase tree cover rather than forest area. Therefore, in the ensuing part of the analysis, this will be deemed implied that any increase in the forest area of the district would be possible only through increasing the tree cover.

5.2 PLAN OF INCREASING FOREST COVER

As the district's forest area is far below the recommended norms, there is need to promote the forest cover in Moradabad district. Such an increase can not simply be planned by taking out some areas from other land uses in order to develop forest area. As the enhancement in the forest area is possible through increased tree cover, this may be planned by plantation of trees under different categories of land uses without much disturbing existing land use categories. This may be achieved through agro and social forestry.

In this connection an important issue is to be resolved as to how much land area of other land uses can be utilized for plantation for increasing the tree cover in the years to come. On the basis of discussions with the officials of the Department of Forest, Government of Uttar Pradesh, Directorate of Agriculture and Bhumi Sudhar Nigar, following methodology has been adopted.

5.2.1 Methodology

The tree plantation is most suitable in the cultivated area despite the fact that tree plantation on large scale on the cultivated area may practically not be possible. Considering this fact, it is to be planned that how much of the net sown area could be covered with the trees during each year. Apart from this, the land owners falling in different categories of land holdings own different land sizes. In such conditions, a uniform area can not be decided from each land size category to enhance the tree cover. As shown in Table 5.1, net sown area of Moradabad district has been classified into five different categories for this purpose and it is proposed to cover different proportions of area under each class from less than one hectare to ten hectares and above. Taking into consideration all sizes of net sown area, 0.50 per cent of the total net sown area of the district is proposed to be covered with trees each year from 2001-2002 to 2009-2010.

Table 5.1: **Plan of Tree Cover on Net Sown Area in Moradabad District**

Land Size Group (Ha.)	Percentage of Area Proposed for Tree Cover
Less than One Ha.	0.11
1 – 2 Ha.	0.54
2 – 4 Ha.	0.81
4 – 10 Ha.	1.08
10 Ha. and above	1.35
Total	0.50

The other land use categories as the barren land on which plantation is proposed for increasing the tree cover in the district. The Directorate of Agriculture and Bhumi Sudhar Nigam are engaged in the reclamation of barren land that included the Sodic land also. In course of meetings with the officials of both the Departments, it was revealed that in the category of barren land, about 35 per cent land is completely unfit for any use and can not be put to any other use. In this way, 35 per cent of land falling in this category has to be left and remaining 65 per cent of the land is to be considered for different uses. In the methodology of this study, it has been decided to undertake plantation on 2 per cent of the remaining (65 per cent) barren land during each year from 2001-2002 to 2009-2010.

Other category of land, which is under non-agricultural uses has emerged as one of the important use of the land due to the ongoing process of urbanisation and industrialisation in Moradabad district, around ten per cent of the district's reported area has been put to different non-agricultural uses. The department of forest estimated and proposed for bringing 0.50 per cent of area being used for non-agricultural purposes under tree cover each year.

Another category of land classification is culturable waste which although is not found under cultivation, but is worth bringing under cultivation. The Department of Forest has planned to use 6.25 per cent of total culturable waste each year to increase the tree cover. It was further arrived at that this is on the higher side, as per our methodology, in case of Moradabad district it is planned to use 1.50 per cent of culturable waste for plantation to increase the tree cover.

The area under pasture land is also found to be very low in the district as in case of area under forest. Its area is stagnating around 0.10 per cent of the total reported area for last many years. Considering the existing livestock population of the state, it is not deemed feasible to extent tree cover on the permanent pasture land.

The area under miscellaneous trees and groves is recorded to be on the higher side as compared to the forest area in the district. But under the existing pressure of urbanization and industrial ventures, the process of decline in area under this category has set in and can not be stopped unless some drastic measures are adopted. In view of this, the area under miscellaneous tree is likely to continue the same in the near future. In such a situation, whatever area of miscellaneous trees would be available, that will be treated as part of the forest area.

The fallow land of the district is comprising of current and other fallows. The current fallow is left uncultivated during the current agricultural year. The other is old fallow, which remains uncultivated for more than one year. While planning for increasing the tree cover, on these categories of land, Department of Forest is optimistic to utilize much higher percentage of both the fallows each year. But this plan is different from their view in this regard. According to our methodology, it is proposed to increase the tree cover in Moradabad district by bringing 1 per cent of the current fallow and 1 per cent of total area of other fallow land each year.

As per proposed methodology, the area under different land uses on which tree cover has been planned to be extended is presented in Table 5.2.

Table 5.2: **Area of Different Land Uses on Which is to be used for Tree Cover in Moradabad District Upto 2009-2010**

(Hect.)

Year	Net Sown Area	Barren Land	Land under Non-Agricultural Uses	Culturable Waste	Current Fallow	Other Fallow	Existing Forest Area	Total Area Proposed for Tree Cover (2 to 8)	Percentage of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	--	--	--	--	--	--	223	--	0.06
2001-02	1596	57	187	24	77	26	223	2190	0.58
2002-03	1583	55	194	23	73	25	2190	4143	1.10
2003-04	1571	53	200	22	69	24	4143	6082	1.61
2004-05	1557	51	207	21	65	23	6082	8006	2.13
2005-06	1544	49	215	20	61	21	8006	9916	2.64
2006-07	1529	47	222	19	58	20	9916	11811	3.15
2007-08	1516	45	230	18	55	19	11811	13694	3.64
2008-09	1501	43	238	17	52	18	13694	15563	4.14
2009-10	1486	41	246	17	49	17	15563	17419	4.63

As per the estimates, presented in the above Table, there would be an additional tree cover by about 8.80 per cent in the year 2001-2002 of the existed area during the year 2000-2001. But during the coming years, the percentage of additional tree cover to the existing forest area would tend to decline. It will come down to 11.93 per cent of the then existing forest area during the year 2009-2010. However, as per our proposed plan of forest development, the area under forest in the district will increase. The share of forest area in total reported area of the district should increase to 0.58 per cent during the year 2001-2002 as shown in Table 5.2. By the end of the year 2009-2010, the share of the forest area to total district's reported area is expected to increase to 4.63 per cent.

Accordingly, the share of forest area in total reported area of the district would be 1.61 per cent during the year 2003-2004. Any planning to increase forest cover beyond the level what has been planned here would not be feasible as many financial constraints may come in the way of a higher level of plantation. An estimate of the funds that would be required to increase the proposed tree cover with the assumption that the proposed increase in forest cover would be possible to be achieved through people's participation not through involving departmental afforestation. The non-departmental expenditure will cost only the supply of seedlings at the rate of 1100 seedlings per hectare, costing Rs.5.00 per seedling. These may also be grown privately and the farmers may be provided with these seedlings at concessional rates. Assuming that there would be need of 1100 seedlings per hectare at the rate of Rs.5.00 per seedling, the estimated financial requirement would be around Rs.1,08,00,000 to Rs.1,02,00,000 lakhs over the years 2001-2002 to 2009-2010. The year-wise area, seedling requirement along with total cost estimation is presented in Table 5.3.

Table 5.3 : **Finance Required for the Proposed Area in Tree Cover of Moradabad District, 2001-2002 to 2009-2010**

Year	Total Area (Ha.)	Total Seedling Required (No.)	Rate of Seedlings (Rs.)	Total Cost (Rs.)
2001-02	1967	2163700	5.00	10818500
2002-03	1953	2148300	5.00	10741500
2003-04	1939	2132900	5.00	10664500
2004-05	1924	2116400	5.00	10582000
2005-06	1910	2101000	5.00	10505000
2006-07	1895	2084500	5.00	10422500
2007-08	1883	2071300	5.00	10356500
2008-09	1869	2055900	5.00	10279500
2009-10	1856	2041600	5.00	10208000

5.3 PLAN OF BARREN LAND USE

The interpretation of data of area under barren land, available through government publications is in two forms. One is the land area under barren land which may be deemed as the part of the land which can not be utilized either for cultivation or to grow any other type of vegetation. The other form is the land area which is called the area under usar and non-cultivable land. In this categorization of barren land, the area is further bifurcated in two parts. One is the usar land which can be reclaimed and put under cultivation and other is the land which is totally unfit for any use. This is the inherent shortcoming in the published data through the Department of Agriculture, which did not clearly distinguished the area under usar land and the area which is found worthless for any use. The officials of the Directorate of Agriculture agreed and highlighted towards serious problems in collection and publication of the state land use data. They also admitted the view that out of the total land area shown as barren, around 35 per cent cannot be put to any use. Based on the discussions with the officials of the Agriculture Department, following barren land utilization for Moradabad district has been formulated.

In the earlier part, 2 per cent of the reclaimable 65 per cent barren land has been apportioned for afforestation each year from 2000-2001 to 2009-2010 to increase the tree cover in the district. Therefore, this part of barren land for promoting afforestation would be subtracted each year. The remaining area would be the area of barren land which will be requiring planning its use. As stated earlier, the officials of the Agriculture Department held the view that 35 per cent of the existing barren land is not worth for any use. Following the same observation, 35 per cent of the area from the existing barren land is proposed to be subtracted to arrive at the area of barren land which can be reclaimed for other required uses. Thus, 65 per cent of the barren land during each year becomes available for reclamation. However, the entire 65 per cent of the reclaimable barren land can not be treated at one time.

Department of Agriculture and Bhumi Sudhar Nigam of the State have been engaged in the treatment of barren land. The efforts made by both the departments in this direction have resulted in the reduction of barren land by nearly 2 per cent per year during the last fifteen years. Considering the substantial financial implication of the barren land reclamation and limited budgetary allotment to these departments by the government in the past, it is assumed that both the departments would be able to treat about 2 per cent of the barren land per year during the period from 2001-2002 to 2009-2010. On an average 40 hectares to 56 hectares area of reclaimable barren land would be reclaimed per year in Moradabad district during the period of 2001-2002 to 2009-2010. In Table 5.4 the plan of barren land use in case of Moradabad district for 10 years from 2001-2002 to 2009-10 has been presented.

Table 5.4 : **Proposed Plan of Barren Land Use in Moradabad District**

(in Ha.)

Year	Barren Land	Rocky and Ravenous (35% of Barren Land)	Reclaimable Barren Land	Barren Land Diverted for Tree Cover	Barren Land Available for Reclamation	Proposed for Reclamation	Remaining Barren Land	Net Barren Land Available (3+8)	Percentage of Barren Land in Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	4389	--	--	--	--	--	--	--	1.17
2001-02		1536	2853	57	2796	56	2740	4276	1.14
2002-03		1536	2740	55	2685	54	2631	4167	1.11
2003-04		1536	2631	53	2578	52	2526	4062	1.08
2004-05		1536	2526	51	2475	50	2425	3961	1.05
2005-06		1536	2425	49	2376	48	2328	3864	1.03
2006-07		1536	2328	47	2281	46	2235	3771	1.00
2007-08		1536	2235	45	2190	44	2146	3682	0.98
2008-09		1536	2146	43	2103	42	2061	3597	0.96
2009-10		1536	2061	41	2020	40	1980	3516	0.94

Table indicates that at the outset 35 per cent area of the barren land is deducted and then 2 per cent is left for afforestation from the remaining 65 per cent barren land. The barren land available for reclamation would be around 2796 hectares during the year 2001-2002. This area under barren land will gradually decline to 2020 hectares by the end of the year 2009-2010. As proposed, 2 per cent of this reclaimable land would be treated each year. The reclaimed barren land would be 56 hectares in the year 2001-2002, 54 hectares in the year 2002-2003, 52 hectares in the year 2003-2004, 50 hectares in the year 2004-2005, 48 hectares in the year 2005-2006, 46 hectares in the year 2006-2007, 44 hectares in the year 2007-2008, 42 hectares in the year 2009-2009 and 40 hectares during the year 2009-2010. After reclamation of this land, district of Moradabad would have 4276 hectares of barren land in the year 2001-2002, 4167 hectares in the year 2002-2003, 4062 hectares in the year 2003-2004, 3961 hectares in the year 2004-2005, 3864 hectares in the year 2005-2006, 3771 hectares in the year 2006-2007, 3682 hectares in the year 2007-2008, 3597 hectares in the year 2008-2009 and 3516 hectares in the year 2009-2010 the reclaimable barren land. The remaining barren land would constitute a lower share of area under barren land in total reported area of the district. However, the barren land inclusive of non-reclaimable would constitute a relatively higher share of area in total reported area of the district.

5.4 PLAN OF LAND AREA UNDER NON-AGRICULTURAL USES

With the growth in population and urbanized activities, there has been a continuous increment in the share of area under non-agricultural uses in total reported area in the district during last two decades. The share of the area under non-agricultural uses in total

reported area was found to be 7.91 per cent during the year 1980-81. It has been increasing to 7.87 per cent, 7.99 per cent, 8.78 per cent and 9.96 per cent over the years 1985-86, 1990-91, 1995-96 and 2000-2001 respectively. The area under non-agricultural uses showed a growth of around 12 per cent during the years 1980-81 and 1995-96. The urban area of the district has grown at the same rate during the years 1995-96 and 2000-2001. However, this was not identifiable through the data on land use published from Directorate of Agriculture.

As per the Master Plan of Moradabad, 2001, prepared by the Town and Country Planning, Department of Uttar Pradesh, land used for non-agricultural purposes in urban areas of Moradabad district experienced a growth of about 80 per cent over the years 1980-81 and 2000-2001. On this basis, land put to non-agricultural uses in urban areas of the district had an annual growth of 4 per cent per annum during the last 20 years. It is experienced that the land used for various non-agricultural purposes in rural and urban areas of the district are the housing, commercial offices, industries, recreation/park/play grounds, utility and services, transport, river and open space. Taking into account the growth of population in the district and past growth in the area used for various non-agricultural purposes in urban areas of the district, it is proposed in our methodology that land area put to various non-agricultural uses would have an annual growth of around 4 per cent each year upto the year 2009-2010. It has also been considered that which of the uses of land would be diverted to meet the 4 per cent growth in area of non-agricultural uses each year upto the year 2009-2010. It is decided here that current fallow, other fallow and net area sown will be the three land use categories from where land would be diverted to achieve the growth of 4 per cent in the area used for non-agricultural purposes.

The areas of current fallow, other fallow and net area sown are proposed to be diverted to non-agricultural uses as per their proportionate share in the land use pattern of the district.

As per above mentioned plan of land use, area put to non-agricultural uses which was 37418 hectares in 2000-2001 would increase to 50908 hectares upto the year 2009-2010 indicating a growth of about 36 per cent during this period. The share in reported area would also increase from 9.96 per cent in the year 2000-2001 to 13.54 per cent during the year 2009-2010. The year-wise increase in the area under non-agricultural uses of Moradabad district from the year 2000-2001 to 2009-2010 is presented in Table 5.5.

Table 5.5: **Proposed Plan of Increase in the Area of Non-Agricultural Uses in Moradabad District**

(Hectare)

Year	Area Under Non-Agricultural Uses	Area of Non-Agricultural Uses Diverted for Tree Cover	Net Area Under Non-Agricultural Uses (2-3)	Net Area Sown to be Used for Non-Agricultural Uses	Area of Current Fallow to be used for Non-Agricultural Uses	Area of Other Fallow to be used for Non-Agricultural Uses	Total Area to be used for Non-Agricultural Uses (4 to 7)	% of Reporting Area
1	2	3	4	5	6	7	8	9
2000-01	37418	--	--	--	--	--	--	9.96
2001-02	37418	187	37231	35	12	1442	38720	10.30
2002-03	38720	194	38526	36	12	1493	40067	10.66
2003-04	40067	200	39867	37	13	1545	41462	11.03
2004-05	41462	207	41255	38	14	1598	42905	11.42
2005-06	42905	215	42690	40	14	1654	44398	11.81
2006-07	44398	222	44176	41	14	1712	45943	12.22
2007-08	45943	230	45713	43	15	1771	47542	12.65
2008-09	47542	238	47304	44	15	1833	49196	13.09
2009-10	49196	246	48950	46	16	1896	50908	13.54

5.5 PLAN FOR CULTURABLE WASTE

The area under culturable waste has ranged from 1.22 per cent to 2.09 per cent of the reported area over the years 1980-81 and 1995-96 in the district of Moradabad. It has finally come down to 0.43 per cent of the reported area during the year 2000-2001. Despite substantial decline in its area in the district during the last three-four years, it is found reasonable to plan for using the culturable waste land particularly for cultivation in view of the growing landless or near landless households in the district. Apart from this, a share of 1.50 per cent from the existing culturable waste land is also proposed to be diverted to do afforestation for increasing the tree cover in the district. The officials from the Department of Agriculture, Government of Uttar Pradesh, held the view that in the present circumstances there are mainly encroachments in the cultivated area of the district. In order to maintain the net sown area despite all probable encroachments, diversion of culturable waste area may prove to be useful in stabilizing the net sown area of the district.

In the discussion with the officials of the Department of Agriculture in order to decide the area of culturable waste to be diverted for utilization, it was decided that efforts should be made to divert 3 per cent of the area under culturable waste to net sown area during each year upto the year 2009-2010. This diversion will be made after apportioning 1.50 per cent of the culturable waste for the use of increasing tree cover of the district. This decided on the basis of the trend of utilization of culturable waste in the past and the existing size of the area under this category in the district. On the basis of this, the area under culturable waste would be reduced by around 34 per cent over the years 2000-2001 and 2009-2010. This would help in a gradual decline in the share of the area of culturable waste in reported area of the district during the years under consideration. The area under

culturable waste which was 0.43 per cent of the total reported area in the district during the year 2000-2001, would be reduced to 0.28 per cent by the year 2009-2010 after implementation of this plan. Table 5.6 presents a utilization plan for culturable waste land in Moradabad district.

Table 5.6: **Proposed Plan for the Use of Culturable Waste in Moradabad District**

(in Hectare)

Year	Culturable Waste	Area of Culturable Waste Diverted to Tree Cover	Area of Culturable Waste Diverted to Net Area Sown	Remaining Culturable Waste (2-3-4)	% of Reporting Area
1	2	3	4	5	6
2000-01	1602	--	--	--	0.43
2001-02	1602	24	47	1531	0.41
2002-03	1531	23	45	1463	0.39
2003-04	1463	22	43	1398	0.37
2004-05	1398	21	41	1336	0.36
2005-06	1336	20	39	1277	0.34
2006-07	1277	19	38	1220	0.32
2007-08	1220	18	36	1166	0.31
2008-09	1166	17	34	1115	0.30
2009-10	1115	17	33	1065	0.28

5.6 PLAN FOR THE PASTURE LAND

The district had a very low area under pasture land from the past two decades for which data is been considered. The area under pasture land was only 985 hectares which constituted 0.17 per cent of the reported area of the district during the year 1980-81. Since then there was a continuous decline in this and the area has finally come down to merely 358 hectares constituting 0.10 per cent of the reported area in the district during the year 2000-2001. The problem of diminishing pasture land in the district has increased

because of encroachment in its area for cultivation and other purposes despite strict government orders for the not diverting the same to other uses including for agricultural purposes. In fact, over the last many years the use of draft animals in agriculture has reduced substantially in the district due to automation of agriculture which led to adoption of modern agricultural practices reducing the use of draft animals for cultivation. This has led to reduced dependence on draft animals. But despite this development, the area of district pasture land is found insufficient to meet the demand of feeding the existing livestock population. This has led to cultivation of fodder crops in the district area. In view of these conditions, any further encroachment in the area under pasture land may lead to serious problems for feeding the livestock population in the district in near future. Hence, in the proposed Model Land Use Plan of Moradabad district, any diversion of the area from the pasture land is to be checked through proper legislation and its implementation. There should not be any further decline in the pasture land of district till 2009-2010, which should also be ensured by the revenue officials and village panchayats.

5.7 PLAN FOR THE MISCELLANEOUS TREES

The area under this category has been very low in the district. It has ranged from 2419 hectares to 5676 hectares during the years 1980-81 to 1995-96 in the district. Its area has come down to merely 2306 hectares during the year 2000-2001. Its share in the total reported area has increased from 0.41 per cent in the year 1980-81 to 0.95 per cent during the year 1995-96. But the same has gone down to 0.61 per cent during the year 2000-2001. The area under miscellaneous trees was seen to be reducing about 60 per cent over the last five years. However, this sharp decline in the area of miscellaneous trees was found mainly due to diversion of district area to some other district during this

period. In view of the small size of land area under miscellaneous trees and the importance of trees for the maintenance of healthy environmental conditions, meeting the needs of the fuel and furniture wood seems to be no logic for its further use. Hence, whatever area has been found available under this category should be protected. The existing government orders to check the tree cutting should be implemented seriously in order to see that the ongoing tree plantation planning is successful in increasing the tree cover of the district in future period.

5.8 PLAN FOR CURRENT FALLOW

There has been a significant reduction in the area of current fallow in the district during the past 20 years. Even then about eight thousand hectares of land is found lying unutilized for cultivation in this category in the district during the year 2000-2001. The area under current fallow constituted about 3 per cent of the reported area during the year 1980-81 has gone down to 2.54 per cent, 2.31 per cent, 2.25 per cent and finally 2.04 per cent during the years 1985-86, 1990-91, 1995-96 and 1990-91 respectively.

The area under current fallow in the district is found to be comparatively on the higher side considering the other district of the State. In view of this, there is an ample scope for planning the utilization of current fallow land which, in fact, is a part of the net sown area of the district.

Keeping in view the size of the area of current fallow in the district and also the views of the officials belonging to Department of Agriculture, it has been decided to utilize 4 per cent of the area of both types of fallow land (current and old fallows) for cultivation. The share of each of the two fallows proposed for utilization would be divided on the basis

of proportionate share of each of the fallow land in the total fallow land of the district. On this basis, the existing area under current fallow land which was 7683 hectares during the year 2000-2001 would be reduced to 4575 hectares by the end of the year 2009-2010. The share of current fallow which was 2.04 per cent during the year 2000-2001 in the reported area of the district would gradually come down by getting diverted to other uses (mainly cultivation) over the years and will be reduced to 1.22 per cent by the year 2009-2010. Besides, it has already been planned to use 1 per cent of the area of the current fallow for increasing tree cover and for non-agricultural uses in their proportionate share in Moradabad district during each year upto the year 2009-2010. The details of proposed plan for utilizing the current fallow land of the district is presented in Table 5.7.

Table 5.7: **Proposed Plan for the Use of Current Fallow in Moradabad District**

(in Hectare)

Year	Current Fallow	Area of Current Fallow Diverted for Tree Cover	Area of Current Fallow Diverted for Non-Agricultural Uses	Area of Current Fallow Diverted for Net Area Sown	Remaining Current Fallow Land {(2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	7683	--	--	--	--	2.04
2001-02	7683	77	35	302	7269	1.93
2002-03	7269	73	36	286	6874	1.83
2003-04	6874	69	37	270	6498	1.72
2004-05	6498	65	38	255	6140	1.63
2005-06	6140	61	40	242	5797	1.54
2006-07	5797	58	41	227	5471	1.46
2007-08	5471	55	43	215	5158	1.37
2008-09	5158	52	44	202	4860	1.29
2009-10	4860	49	46	190	4575	1.22

5.9 PLAN FOR OTHER FALLOW

The area under other fallow land includes the land which has not been in the use of cultivation for three-four years and more than this. The area under this category has not been very high in the district and was recorded to be comparatively lower than the current fallow land of the district. The share of other fallow land in total reported area was about 1.12 per cent during the year 1980-81 has increased to 1.39 per cent during the year 1985-86. Hence onward, area under other fallow has been going down in the district in the successive years. It was found to be the 0.70 per cent of the total reported area during the year 2000-2001.

Since the area of the fallow land has been a part of the net sown area, it is decided to plan for bringing some of its area under cultivation during each year upto the year 2009-2010. As stated earlier, 4 per cent of the area of both the fallows is proposed for diversion to the cultivation during each year upto 2009-2010. The contribution of each of the fallow land in 4 per cent would be as per their proportionate share in the total fallow land of this district. In this way, as shown in Table 5.8, around 760 hectares of other fallow land would be diverted for use of cultivation by 2009-2010. Apart from this the area of existing other fallow land would be used for non-agricultural uses and also for developing the tree cover in the district. Still, the area under other fallow would exist to the level of 1570 hectares in the district by the year ending 2009-2010. The share of other fallow land in total reported area which is found to be 0.70 per cent during the year 2000-2001 would come down to 0.42 per cent by the year 2009-2010. Besides this, 1 per cent of the old fallow land would be used to increase the tree cover on an annual basis in the

district. Along with this a proportionate share of the decided area would also be apportioned to be used for non-agricultural uses every year.

Table 5.8: **Proposed Plan for the Use of Other Fallow in Moradabad District**

(in Hectare)

Year	Other Fallow	Area of Other Fallow Diverted for Tree Cover	Area of Other Fallow Diverted for Non-Agricultural Uses	Area of Other Fallow Diverted for Net Area Sown	Remaining Other Fallow Land ((2-3-4)-5}	% of Reporting Area
1	2	3	4	5	6	7
2000-01	2647	--	--	--	--	0.70
2001-02	2647	26	12	105	2504	0.67
2002-03	2504	25	12	99	2368	0.63
2003-04	2368	24	13	94	2337	0.62
2004-05	2337	23	14	89	2111	0.56
2005-06	2111	21	14	83	1993	0.53
2006-07	1993	20	14	79	1880	0.50
2007-08	1880	19	15	74	1772	0.47
2008-09	1772	18	15	70	1669	0.44
2009-10	1669	17	16	66	1570	0.42

5.10 PLAN FOR NET AREA SOWN

The present model plan for net sown area has come out after diverting the area under proposed plan of other uses of land upto the year 2009-2010. As mentioned earlier, 0.50 per cent of the net sown area is proposed to be used for increasing tree cover in the district and 96.87 per cent of the 4 per cent of its area is planned to be diverted for non-agricultural uses. It was also decided to reclaim 2 per cent of the barren land to be added in the net sown area. It is further planned to bring 3 per cent of the culturable waste land

under cultivation each year and 4 per cent of area from both the fallow land, according to their proportionate share, is also planned to be used for cultivation. In order to achieve the balance in the land use of total district area, the share of net sown area is likely to decline marginally to 78.26 per cent of the total reported area by the year 2009-2010 as compared to net sown area of 84.93 per cent during the year 2000-2001. Table 5.9 presents the picture of proposed plan of net sown area for the years 2000-2001 to 2009-2010.

Table 5.9 : **Proposed Plan for the Net Area Sown in Moradabad District**

(in Ha.)

Year	Net Area Sown	Net Area Sown Diverted for Tree Cover	Net Area Sown Diverted for Non-Agricul-tural Uses	Barren Land Added to Net Area Sown	Current Fallow Added to Net Area Sown	Other Fallow Added to Net Area Sown	Culturable Waste Added to Net Area Sown	Total Net Area Sown (2-3-4+ 5+6+7+8)	Percentag e of Reporting Area
1	2	3	4	5	6	7	8	9	10
2000-01	319239	--	--	--	--	--	--	--	84.93
2001-02	319239	1596	1442	56	47	302	105	316711	84.26
2002-03	316711	1583	1493	54	45	286	99	314119	83.57
2003-04	314119	1571	1545	52	43	270	94	311462	82.86
2004-05	311462	1557	1598	50	41	255	89	308742	82.14
2005-06	308742	1544	1654	48	39	242	83	305956	81.40
2006-07	305956	1529	1712	46	38	227	79	303105	80.64
2007-08	303105	1516	1771	44	36	215	74	300187	79.87
2008-09	300187	1501	1833	42	34	202	70	297201	79.07
2009-10	297201	1486	1896	40	33	190	66	294148	78.26

CHAPTER – VI

MODEL LAND USE PLAN OF MORADABAD DISTRICT

In the earlier chapter of the study, a plan has been formulated to present the land utilization under different categories in Moradabad District from the year 2000-2001 to 2009-2010. The plan has been formulated on the basis of three variable considerations. First is the past changes in the land use pattern in each of the nine fold classifications of land use. Second is the progress and plan of the concerned departments for the management of different uses of land and consideration of financial implications involved therein. The third is related to the assessment of the situation that to what extent the past trends and achievements of the concerned departments would be agglomerated to arrive at the situation which shall be closer to the reality. Thus, on the basis of above considerations, this is an attempt to prepare the proposed plan in all possible ways to depict different uses of land more realistically so that its implementation becomes possible by the concerned departments.

6.1 FRAMEWORK OF THE PLAN

The following framework was developed to formulate the Model Land Use Plan of the Moradabad District:

Table 6.1: **Framework of Model Land Use Plan**

Sl.No.	Land Use Category	Constituents of Proposed Land Use Plan of each category (2000-2001 to 2009-2010)
1.	Reporting Area	Constant
2.	Forest	Existing area + 0.50 per cent area of Net Area Sown + 2 per cent area of barren land + 0.50 per cent area of Non-Agricultural Uses + 1.50 per cent area of culturable waste + 1 per cent area of current fallow and 1 per cent area of other fallow.
3.	Barren Land	Existing area – 35 per cent rocky and ravines – 2 per cent went to Forest – 2 per cent went to Net Area Sown.
4.	Land Under Non-Agricultural Uses	Existing area – 0.50 per cent went to Forest + 4 per cent area of current, other and net area sown (Share of 4 per cent in each category, 2.33, 0.80 and 96.87 per cent).
5.	Culturable Waste	Existing area – 1.50 per cent area went to Forest – 3 per cent area went to Net Area Sown
6.	Permanent Pasture	Constant
7.	Miscellaneous Trees	Constant
8.	Current Fallow	Existing area – 1 per cent went to Forest – 2.33 per cent of share of 4 per cent went to non-agricultural uses – 74.25 per cent to be diverted to Net Area Sown as per share of 4 per cent of the Total Fallow
9.	Other Fallow	Existing area – 1.0 per cent area went to Forest – 0.80 percent share of 4 per cent went to non-agricultural uses – 25.75 per cent to be diverted to Net Area Sown as per share of 4 per cent of Total Fallow
10.	Net Area Sown	Existing area – 0.50 per cent went to Forest – 96.87 per cent of share of 4 per cent went to non-agricultural uses + 2 per cent from Barren Land + 3 per cent from Culturable Waste + 4 per cent of both fallows.

Based on the above framework, area under forest which may also be called as area under tree cover, which was 0.06 per cent of the reported area during the year 2000-2001 in the district, has shown a consistent increased and may reach to the level of 4.63 per cent of the total reported area of the district by the year 2009-2010. Being a plan based on available resources and the existing limitations in the district, this much area under tree covers would be lower than the recommended norms in the district by the year 2009-2010 laid down under the National Forest Policy.

The plan has also proposed for a consistent decline in the area of barren land from the year beginning from 2000-2001 to 2009-2010. Its share in the reported area of the district which was 1.17 per cent is likely to come down to 0.94 per cent by the year 2009-2010.

Keeping in view the increasing need for the area under non-agricultural uses in the light of growing population and consequently increased activities in the urban and rural areas of the district. The proposed area under non-agricultural uses would also increase in the district from 9.96 per cent in 2000-2001 to 13.54 per cent by the year 2009-2010.

The share of area under culturable waste which was recorded to be quite low, i.e. 0.43 per cent of the reported area during the year 2000-2001 is likely to go down to the level of 0.28 per cent by the year 2009-2010 as per proposed plan for Model Land Use.

No changes in the area under permanent pasture and area under miscellaneous trees and groves have been proposed in view of the existence of very low area under these categories. The concerned departments are expected to remain vigilant to do the needful to maintain the existing status of land area under these two categories.

Although the share of area under the current and other fallow was found to be lower being 2.04 per cent and 0.70 per cent of the reported area respectively during the year 2000-2001, the total of both types of fallow constituted more than ten thousand hectares of land during this year. This was quite a big area which could be used for other purposes specially for cultivation. Considering this, it has been planned to reduce the area of current and other fallows at the rate of 4 per cent annually upto the year 2009-2010. The reduced area would largely be diverted towards the net sown area in respective years. The remaining proportionate share will also be diverted to the non-agricultural uses and to the forest area.

The net impact of the proposed plan for utilization of eight categories of land uses has been on the net area sown. The share of net area sown in the reported area of Moradabad district was 84.93 per cent during the year 2000-2001. On account of planned reallocation of area within eight land uses, net area sown would change in each successive years after 2000-2001 and its share in the total reported area is likely to remain around 78.26 per cent by the year 2009-2010. The following Table 6.2 shows the final proposed Model Land Use Plan of Moradabad District for the period starting from 2001-2002 to 2009-2010.

Table 6.2: **Model Land Use Plan of Moradabad District: 2000-2001 to 2009-2010**

(Hect.)

Land Use Category	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
Reporting Area	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)	375865 (100.00)
Forest	223 (0.06)	2190 (0.58)	4143 (1.10)	6082 (1.61)	8006 (2.13)	9916 (2.64)	11811 (3.15)	13694 (3.64)	15563 (4.14)	17419 (4.63)
Barren Land	4389 (1.17)	4276 (1.14)	4167 (1.11)	4062 (1.08)	3961 (1.05)	3864 (1.03)	3771 (1.00)	3682 (0.98)	3597 (0.96)	3516 (0.94)
Land Under Non-Agricultural Uses	37418 (9.96)	38720 (10.30)	40067 (10.66)	41462 (11.03)	42905 (11.42)	44398 (11.81)	45943 (12.22)	47542 (12.65)	49196 (13.09)	50908 (13.54)
Culturable Waste	1602 (0.43)	1531 (0.41)	1463 (0.39)	1398 (0.37)	1336 (0.36)	1277 (0.34)	1220 (0.32)	1166 (0.31)	1115 (0.30)	1065 (0.28)
Permanent Pasture	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)	358 (0.10)
Miscellaneous trees	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)	2306 (0.61)
Current Fallow	7683 (2.04)	7269 (1.93)	6874 (1.83)	6498 (1.72)	6140 (1.63)	5797 (1.54)	5471 (1.46)	5158 (1.37)	4860 (1.29)	4575 (1.22)
Other Fallow	2647 (0.70)	2504 (0.67)	2368 (0.63)	2337 (0.62)	2111 (0.56)	1993 (0.53)	1880 (0.50)	1772 (0.47)	1669 (0.44)	1570 (0.42)
Net Area Sown	319239 (84.93)	316711 (84.26)	314119 (83.57)	311462 (82.86)	308742 (82.14)	305956 (81.40)	303105 (80.64)	300187 (79.87)	297201 (79.07)	294148 (78.26)

Note: Figures in brackets indicate percentage.

Annexure: **Land Use Pattern in Moradabad District**

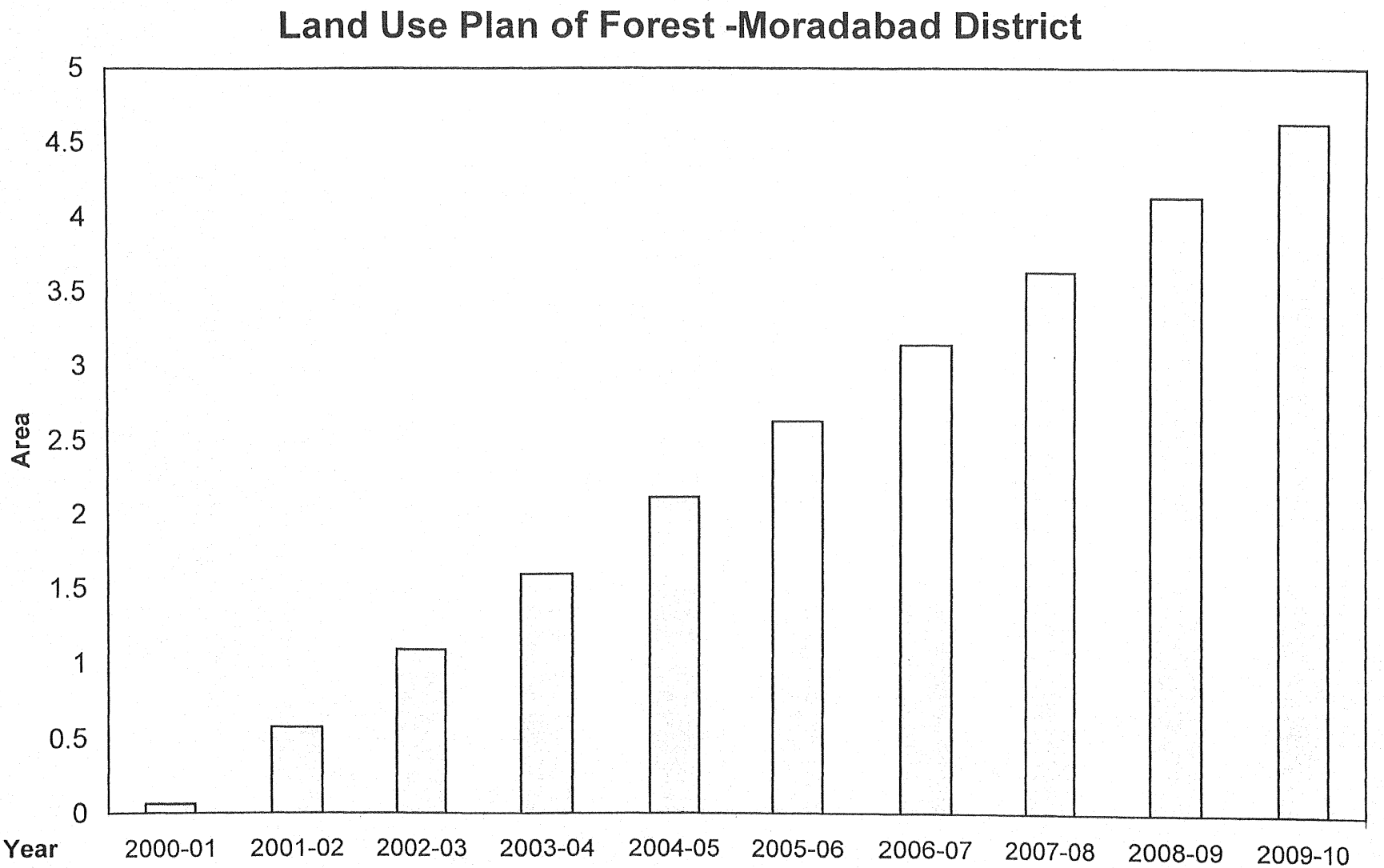
(Hect.)

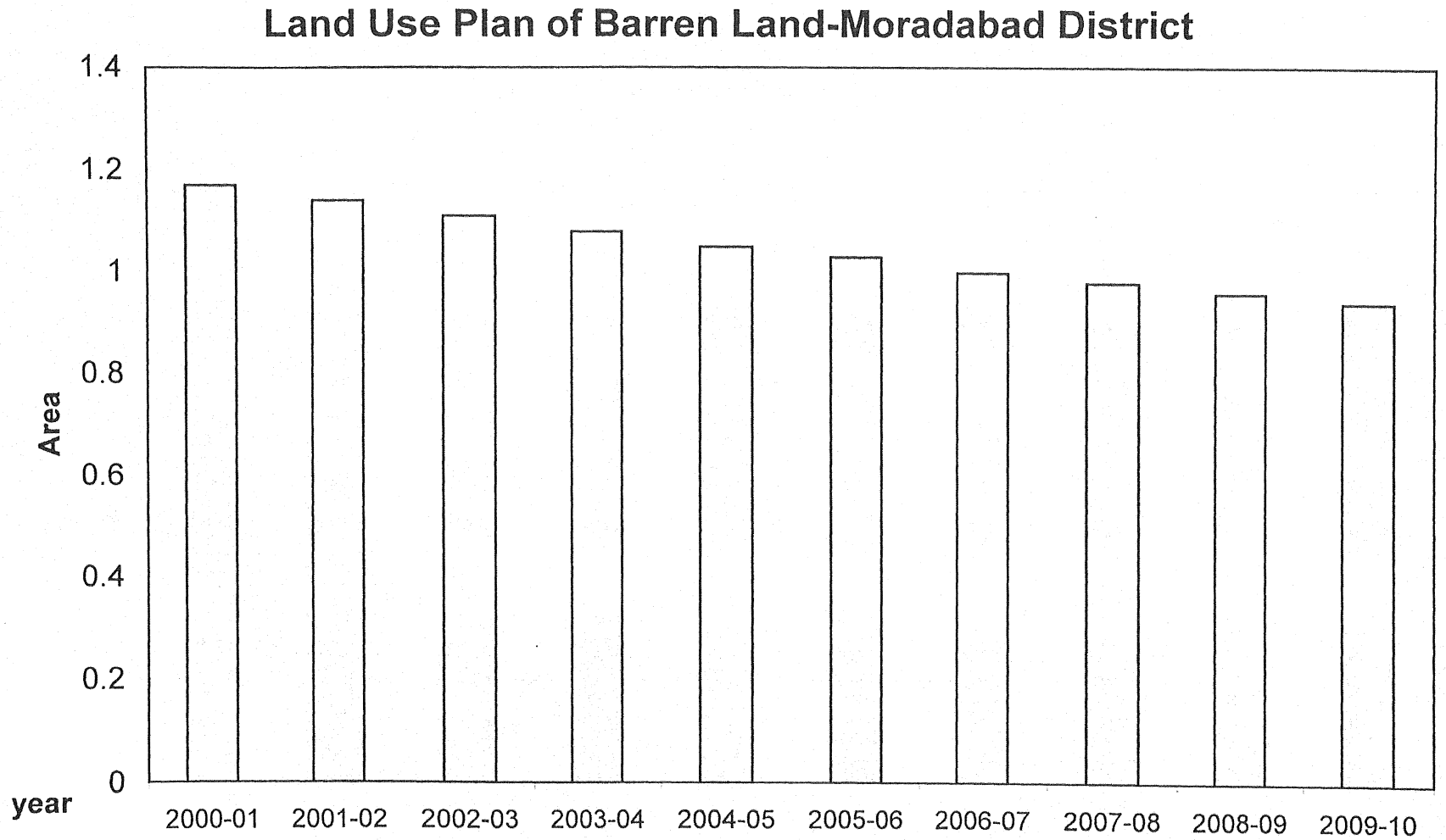
Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1972-73	594450 (100.00)	11867 (2.00)	16246 (2.73)	42798 (7.20)	14556 (2.45)	1344 (0.22)	6438 (1.08)	20390 (3.43)	4744 (0.80)	476067 (80.09)
1974-75	594650 (100.00)	11926 (2.01)	14862 (2.50)	48328 (8.13)	16159 (2.72)	1407 (0.23)	6915 (1.16)	25217 (4.24)	6965 (1.17)	462871 (77.84)
1975-76	594387 (100.00)	11926 (2.01)	15995 (2.69)	47477 (7.99)	14863 (2.50)	1139 (0.19)	7093 (1.19)	30480 (5.13)	6878 (1.16)	458536 (77.14)
1976-77	594143 (100.00)	11928 (2.01)	16112 (2.71)	47837 (8.05)	13578 (2.29)	1120 (0.19)	6633 (1.12)	14938 (2.51)	5527 (0.93)	476470 (80.19)
1977-78	594647 (100.00)	11928 (2.01)	15878 (2.67)	47864 (8.05)	13578 (2.28)	1183 (0.20)	6020 (1.01)	14969 (2.52)	5058 (0.85)	478169 (80.41)
1978-79	592787 (100.00)	11929 (2.01)	15313 (2.58)	47686 (8.05)	13143 (2.22)	1231 (0.21)	2734 (0.46)	23574 (3.98)	5067 (0.85)	472110 (79.64)
1979-80	592716 (100.00)	11920 (2.01)	15106 (2.55)	47742 (8.05)	10716 (1.81)	1166 (0.20)	2921 (0.49)	24145 (4.07)	5624 (0.95)	473376 (79.87)
1980-81	592632 (100.00)	11921 (2.01)	14959 (2.52)	46897 (7.91)	11126 (1.88)	985 (0.17)	2419 (0.41)	18253 (3.08)	6650 (1.12)	479422 (80.90)
1981-82	593661 (100.00)	11921 (2.01)	14964 (2.52)	46415 (7.82)	11126 (1.87)	969 (0.16)	2876 (0.48)	16291 (2.75)	7341 (1.24)	481758 (81.15)
1982-83	593719 (100.00)	11921 (2.01)	14723 (2.48)	47335 (7.97)	11529 (1.94)	1086 (0.18)	2475 (0.42)	14703 (2.48)	6107 (1.03)	483840 (81.49)
1983-84	593850 (100.00)	11921 (2.01)	13831 (2.33)	46498 (7.83)	11012 (1.85)	1104 (0.19)	1749 (0.29)	18055 (3.04)	5913 (1.00)	483767 (81.46)
1984-85	593407 (100.00)	11921 (2.01)	14666 (2.47)	46265 (7.80)	10111 (1.70)	1072 (0.18)	2016 (0.34)	15897 (2.68)	7299 (1.23)	484160 (81.59)
1985-86	593479 (100.00)	11921 (2.01)	15315 (2.58)	46695 (7.87)	9654 (1.63)	1011 (0.17)	3116 (0.53)	15100 (2.54)	8282 (1.39)	482385 (81.28)
1986-87	593343 (100.00)	11921 (2.01)	14088 (2.37)	47622 (8.03)	7510 (1.27)	996 (0.17)	3092 (0.52)	13884 (2.34)	6987 (1.18)	487243 (82.11)
1987-88	593367 (100.00)	11922 (2.01)	13376 (2.25)	47096 (7.94)	7034 (1.19)	941 (0.16)	3553 (0.60)	13861 (2.33)	7126 (1.20)	488458 (82.32)

Annexure (contd.....)

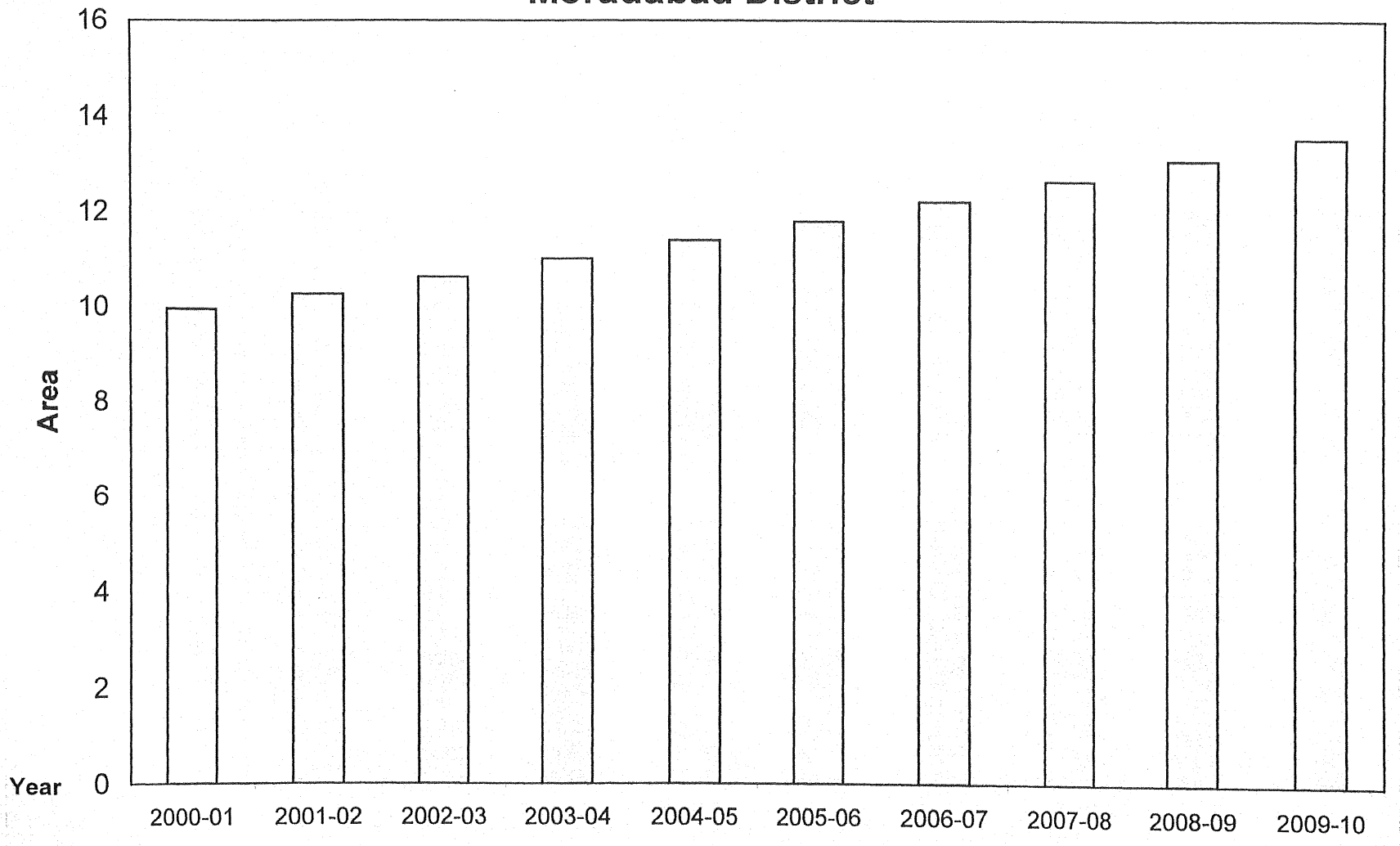
Year	Land Use Categories									
	Reporting Area	Forest	Barren Land	Land Under Non-Agricultural Uses	Culturable Waste	Permanent Pasture	Miscellaneous Trees	Current Fallow	Other Fallow	Net Area Sown
1988-89	593603 (100.00)	11842 (1.99)	12922 (2.18)	47791 (8.05)	6766 (1.14)	977 (0.17)	3730 (0.63)	13623 (2.29)	6467 (1.09)	489485 (82.46)
1989-90	595421 (100.00)	11842 (1.99)	11999 (2.02)	47077 (7.91)	6808 (1.14)	820 (0.14)	5557 (0.93)	14359 (2.41)	7867 (1.32)	489092 (82.14)
1990-91	595421 (100.00)	11922 (2.00)	12418 (2.09)	47571 (7.99)	7238 (1.22)	732 (0.12)	6176 (1.04)	13786 (2.31)	6395 (1.07)	489183 (82.16)
1991-92	595421 (100.00)	11922 (2.00)	6373 (1.07)	48667 (8.18)	11998 (2.02)	678 (0.11)	6204 (1.04)	13276 (2.23)	6713 (1.13)	489570 (82.22)
1992-93	595421 (100.00)	11922 (2.00)	6455 (1.08)	49807 (8.37)	14379 (2.42)	762 (0.13)	7126 (1.20)	10434 (1.75)	7532 (1.26)	487004 (81.79)
1993-94	595378 (100.00)	11922 (2.00)	13060 (2.19)	50215 (8.43)	6005 (1.01)	747 (0.13)	6701 (1.13)	10493 (1.76)	7424 (1.25)	488811 (82.10)
1994-95	596878 (100.00)	11922 (2.00)	5961 (1.00)	51367 (8.61)	13079 (2.19)	887 (0.15)	6203 (1.04)	12921 (2.16)	8022 (1.34)	486516 (81.51)
1995-96	596878 (100.00)	11921 (2.00)	5731 (0.96)	52380 (8.78)	12492 (2.09)	710 (0.12)	5676 (0.95)	13437 (2.25)	7483 (1.25)	487048 (81.60)
1996-97	347972 (100.00)	60 (0.02)	1865 (0.54)	33390 (9.60)	7446 (2.13)	494 (0.14)	4775 (1.37)	925 (0.27)	4505 (1.29)	294512 (84.64)
1997-98	346504 (100.00)	64 (0.02)	1839 (0.53)	33765 (9.74)	5021 (1.45)	402 (0.12)	2242 (0.65)	5967 (1.72)	2748 (0.79)	294456 (84.98)
1998-99	378199 (100.00)	69 (0.02)	1727 (0.46)	35581 (9.40)	4636 (1.23)	356 (0.09)	2459 (0.65)	7142 (1.89)	2751 (0.73)	323478 (85.53)
1999-2000	375865 (100.00)	64 (0.02)	1679 (0.45)	37064 (9.86)	4175 (1.11)	348 (0.09)	2462 (0.66)	7655 (2.04)	2606 (0.69)	319812 (85.09)
2000-01	375865 (100.00)	223 (0.06)	4389 (1.17)	37418 (9.96)	1602 (0.43)	358 (0.10)	2306 (0.61)	7683 (2.04)	2647 (0.70)	319239 (84.93)

Note: Figures in brackets indicate percentage.

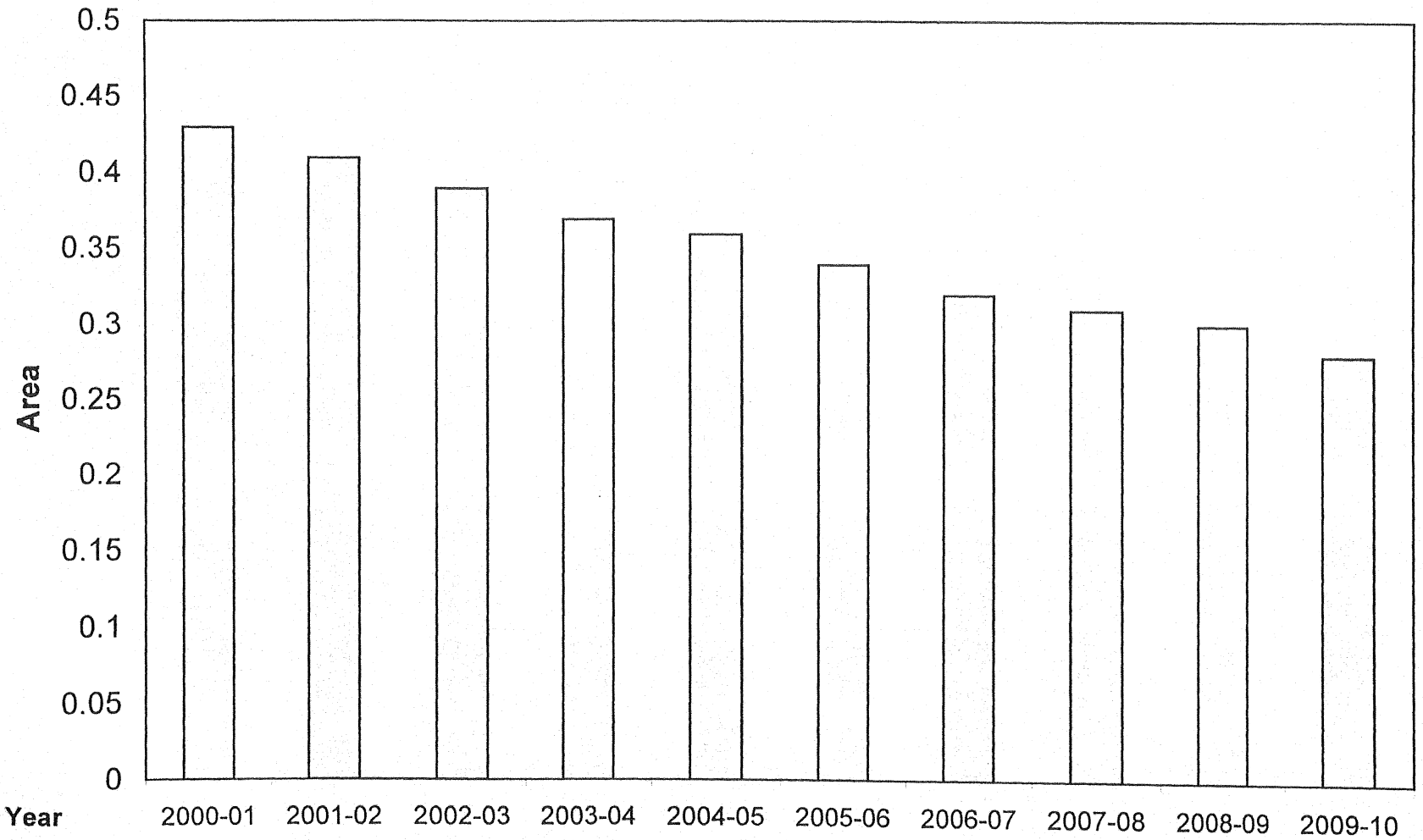

Land Use Plan of Forest -Moradabad District
Area
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Year
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10


Land Use Plan of Barren Land-Moradabad District
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Area
year
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10

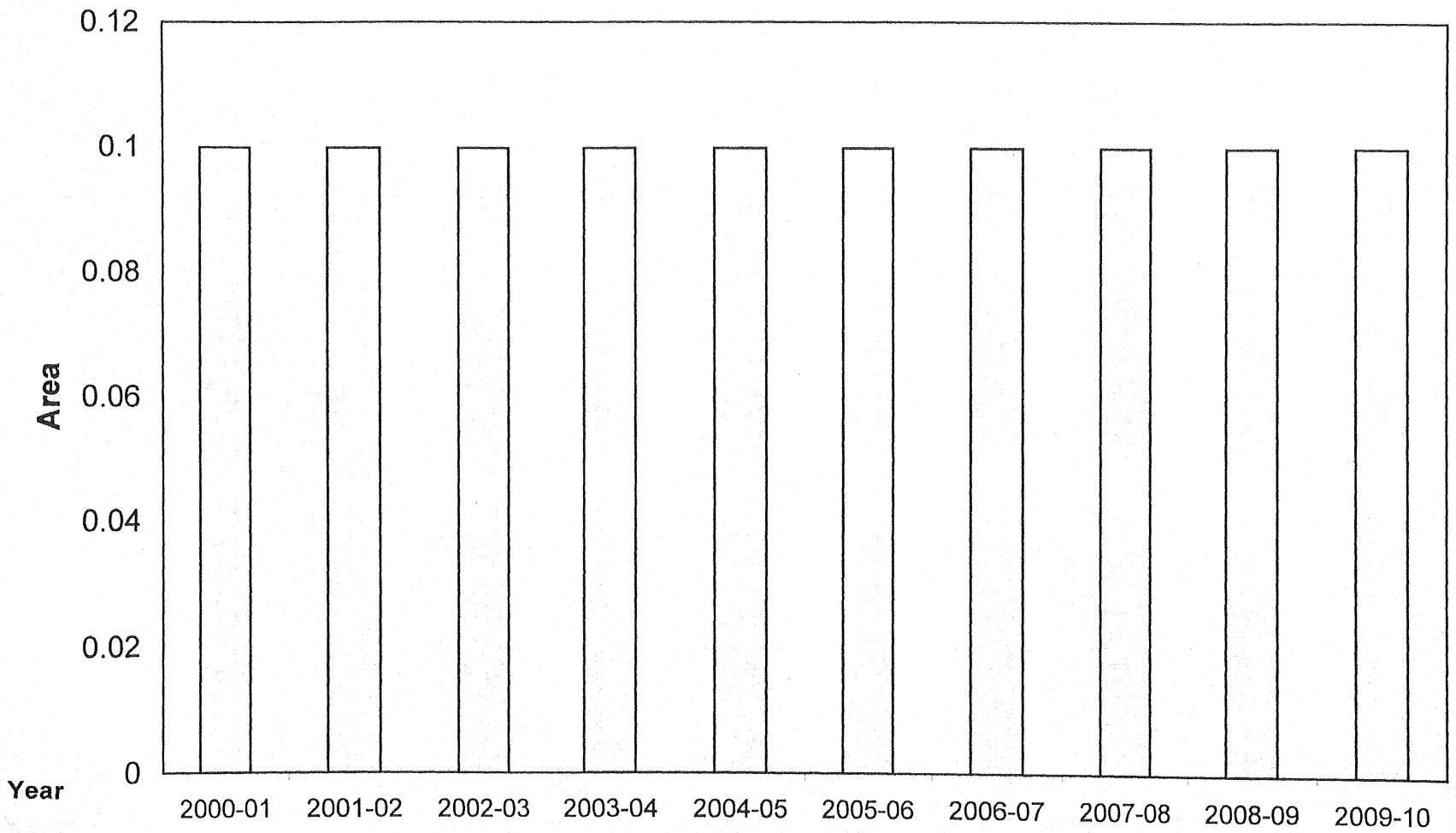
Land Use Plan of Land Under Non-Agricultural Uses- Moradabad District



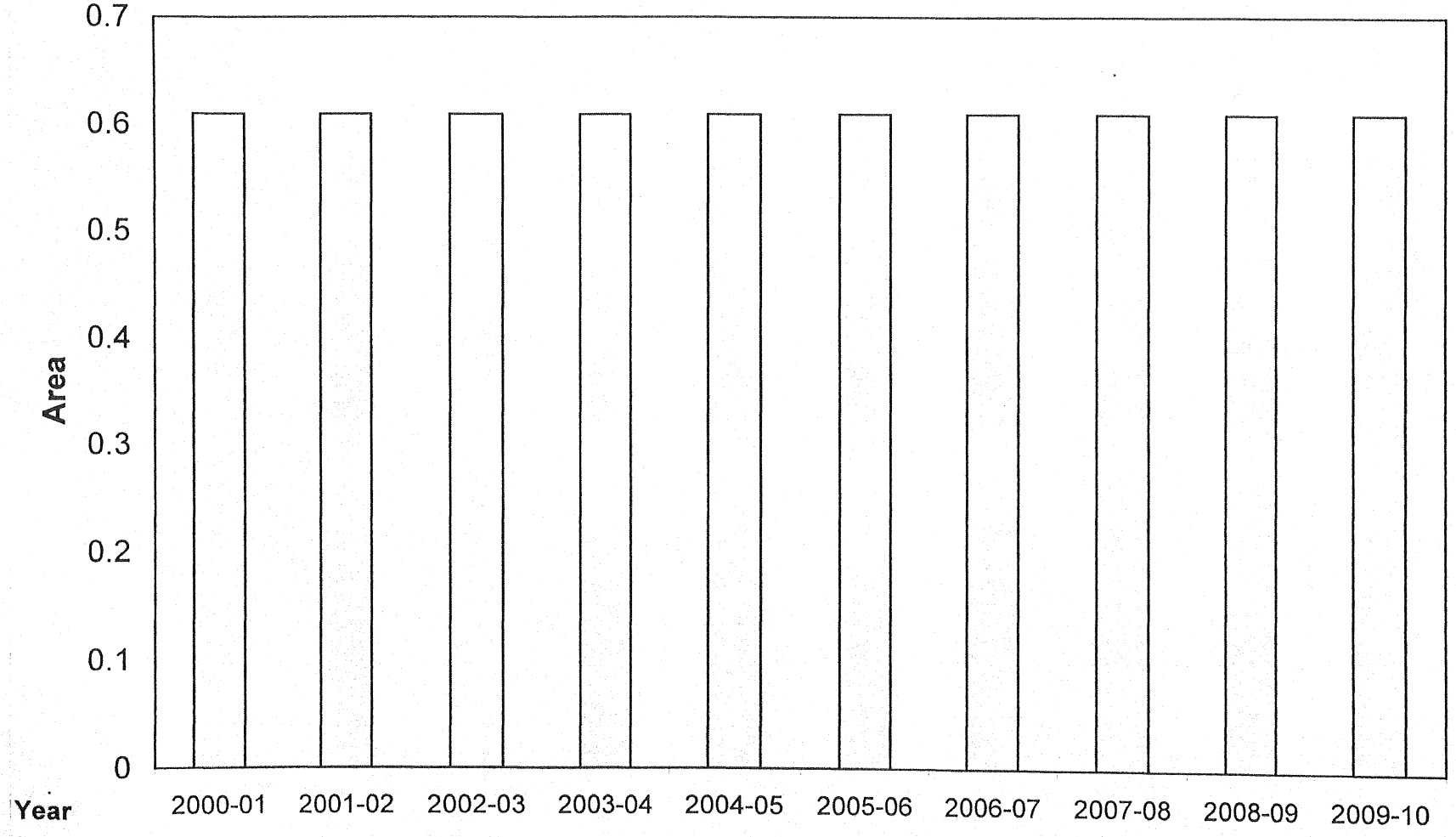
Land Use Plan of Culturable Waste-Moradabad District

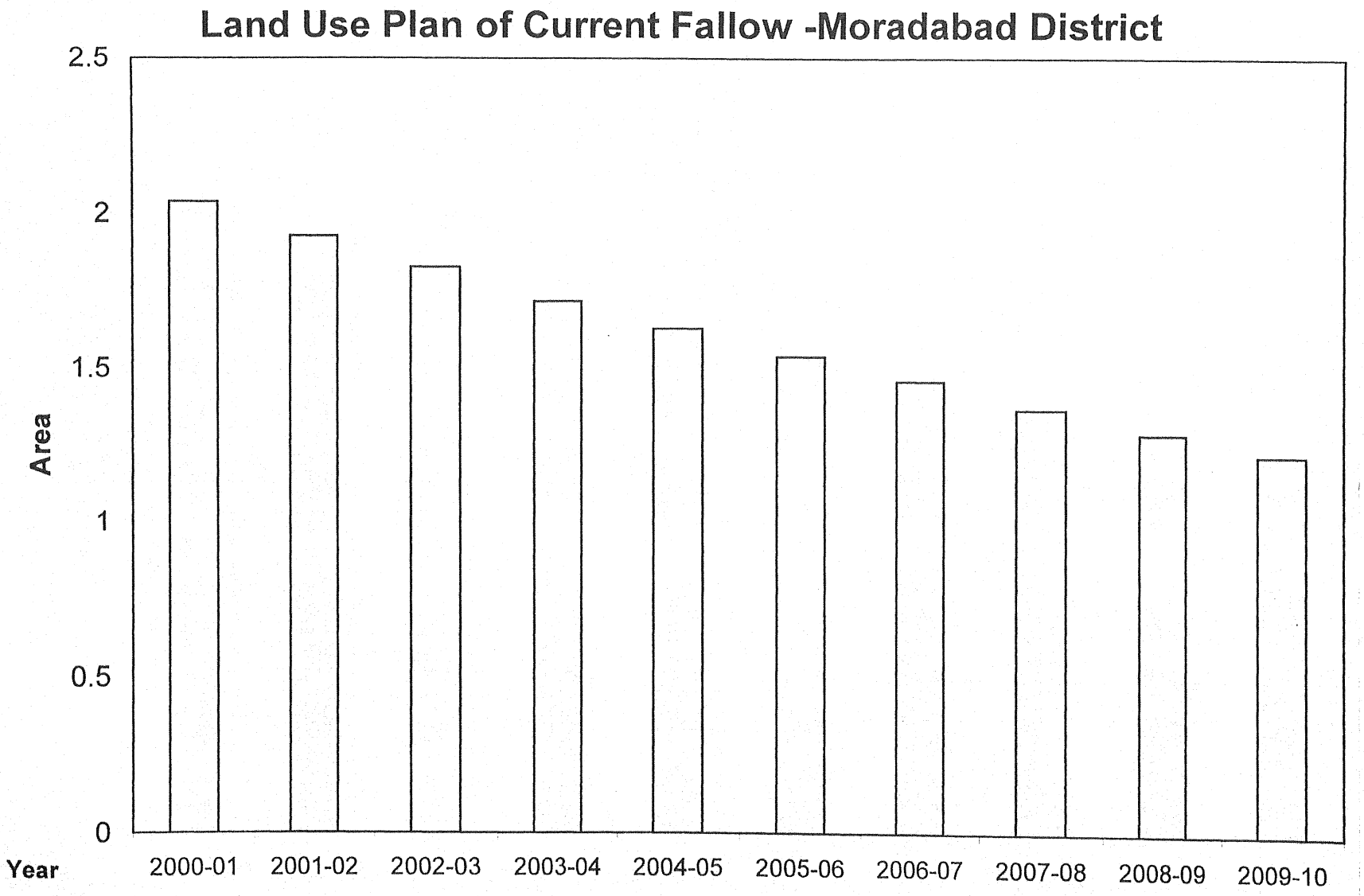


Land Use Plan of Permanent Pasture-Moradabad District

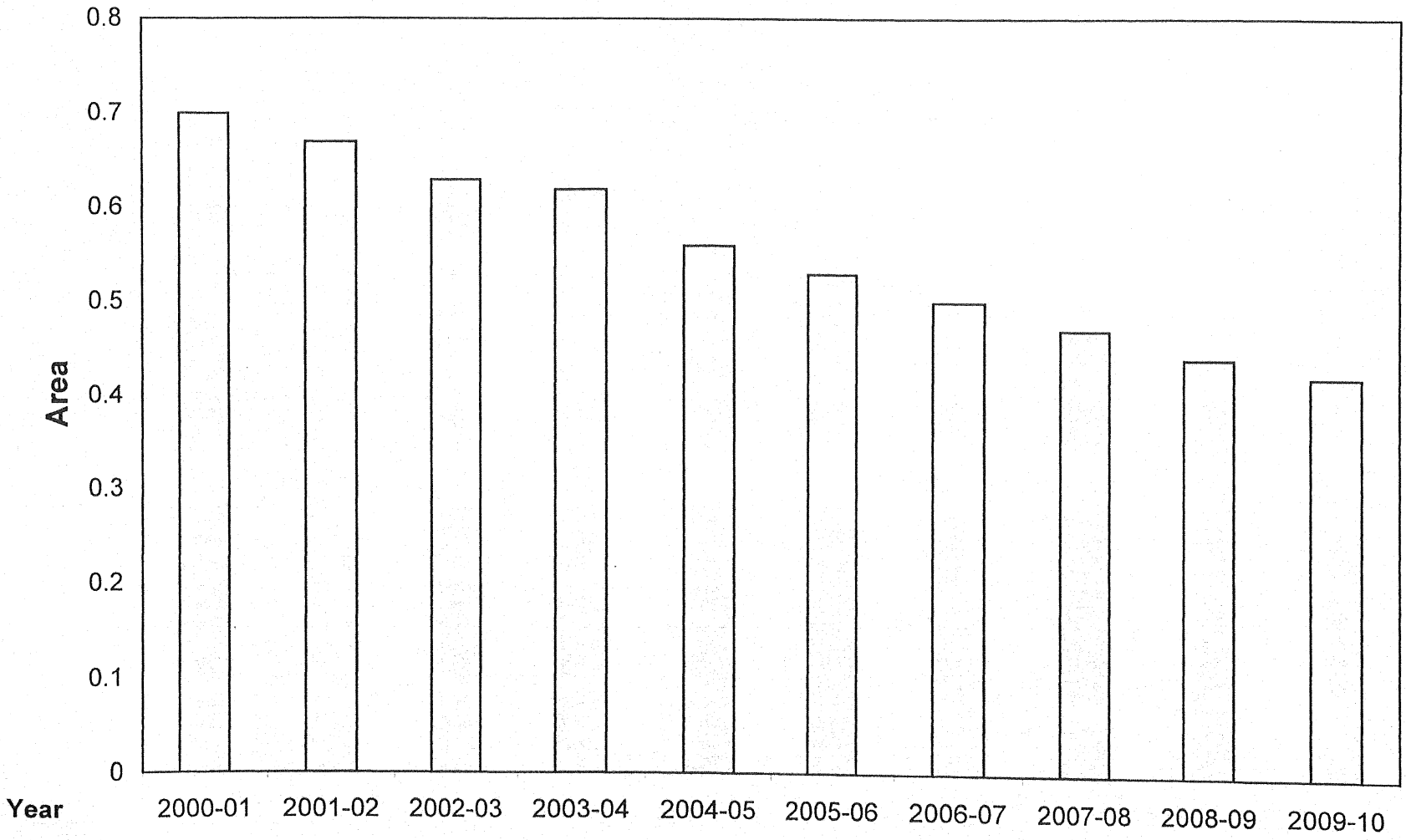


Land Use Plan of Miscellaneous Trees-Moradabad District




Land Use Plan of Current Fallow -Moradabad District
2.5
2
1.5
1
0.5
0
Area
Year
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10

Land Use Plan Of Other Fallow- Moradabad District



Land Use Plan of Net Area Sown-Moradabad District